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a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-001

RFW#: 9903L440 **SDG#**: H0354

SAF#: B99-001

W.O. #: 10985-001-001-9999-00

Date Received: 03-13-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 7 soil samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

- 3. Sample holding times as required by the method and/or contract were met.
- 4. The cooler temperature was recorded on the chain-of-custody.
- 5. The method blank for Chromium VI was within method criteria.
- 6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.
- 7. The matrix spike recoveries were within the 75-125% control limits.
- 8. The replicate analysis for Chromium VI was within the 20% Relative Percent Difference (RPD) control limit.
- 9. Results for solid samples are reported on a dry weight basis.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

njpu03-440

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

01

WET CHEMISTRY METHODS GLOSSARY FOR ANALYSIS OF SOIL/SOLID SAMPLES

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
%Ash	D2216-80		
%Moisture	D2216-80		ILMO4.0 (e)
%Solids			✓ILMO4.0 (e)
%Volatile Solids	D2216-80		
ASTM Extraction in Water	D3987-81/85		
BTU	D240-87	·	
CEC		9081	c
Corrosivity by coupon by pH		1110 (mod) 9045	
Cyanide, Total		_ 9010	_ ILMO4.0 (e)
Cyanide, Reactive		_ Sec 7.3	
Density			_ b
Halides, Extractable Organic			_ EPA 600/4/84-008 (mod)
Halides, Total			_ EPA 600/4/84-008 (mod)
EP-Toxicity		_ 1310A	
Flash Point		1010	
Ignitability		1010	
Carbon, Total Organic (by LOI)			_ c
Oil and Grease		_ ^{9071A}	
Carbon, Total Organic		_ 9060	_ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	_ D240-87 (mod)	_ 5050	
Petroleum Hydrocarbons, Total R	ecoverable	_ ⁹⁰⁷¹	EPA 418.1 (mod)
pH, Soil		_ ^{9045B}	
Sulfide, Reactive		Sec 7.3	
Specific Gravity	D1429-76C		
Sulfur, Total		9056	
TCLP		— ¹³¹¹	
TCLV		_ ¹³¹¹	
Synthetic Precipitation Leach		— ¹³¹²	
Chlorine, Total		_ ⁹⁰⁵⁶	
Paint Filter		_ ⁹⁰⁹⁵	
Other: Chromium	VI Method: S	n 306C-11719	<u>4</u> 1

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- * = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

- 1. ASTM Standard Methods.
- 2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
- 3. <u>Test Methods for Evaluating Solid Waste</u> (USEPA SW-846).
- a. <u>Standard Methods for the Examination of Water and Waste</u>, 16 ed., (1989).
- b. Standard Methods for the Examination of Water and Waste, 17 ed., (1983)
- c. <u>Method of Soil Analysis</u>, Part 1, Physical and Mineralogical Methods, 2nd. Ed. (1986)
- d. <u>Method of Soil Analysis</u>, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965)
- e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
- f. Code of Federal Regulations.

RFW 21-21L-034/D-06/96

INORGANICS DATA SUMMARY REPORT 03/18/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9903L440

			-		REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR

-001	B0TVX5	% Solids	86.5	*	0.01	1.0
		Chromium VI	0.92 u	MG/KG	0.92	1.0
-002	BOTVX6	* Solids	93.0	*	0.01	1.0
		Chromium VI	0. B 6 u	MG/KG	0.86	1.0
-003	BOTVX7	% Solids	87.8	ŧ	0.01	1.0
		Chromium VI	1.0	MG/KG	0.91	1.0
-004	BOTVXB	% Solids	92.4	ŧ	0.01	1.0
		Chromium VI	0.87 u	MG/KG	0.87	1.0
-005	BOTVX9	* Solids	94.4	•	0.01	1.0
		Chromium VI	0.85 u	MG/KG	0.85	1.0
-006	BOTVYO	% Solids	91.7	ŧ	0.01	1.0
		Chromium VI	1.6	MG/KG	0.87	1.0
-007	BOTVY1	% Solids	87.3	¥	0.01	1.0
		Chromium VI	0. 9 2 u	MG/KG	0.92	1.0

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/18/99

CLIENT: TNU-HANFORD B99-001

RECRA LOT #: 9903L440

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
			=======		==========	=======
BLANK10	99LVI028-MB1	Chromium VI	0.80 u	MG/KG	0.80	1.0

INORGANICS ACCURACY REPORT 03/18/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9903L440

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	AMOUNT	*RECOV	FACTOR (SPK)
======				*******			
-006	BOTVYO	Soluble Chromium VI	43.8	1.6	43.6	96.9	1.0
		Insoluble Chromium VI	1230	1.6	1350	90.8	20.0
BLANK10	99LVI028-MB1	Soluble Chromium VI	39.5	0.80u	40.0	98.9	1.0
		Insoluble Chromium VI	1110	0.80u	1160	95.4	20.0

INORGANICS PRECISION REPORT 03/18/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9903L440

			INITIAL			DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	REPLICATE R	PD	FACTOR (REP)
					=====	============
-006REP	BOTVYO	Chromium VI	1.6	1.5	7.4	1.0

Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-001

DATE RECEIVED: 03/13/99 RFW LOT # :9903L440

CLIENT ID /ANALYS	IS RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0TVX5					•	
% SOLIDS CHROMIUM VI	001 001	S S	99L%S040 99LVI028	03/08/99 03/08/99	03/16/99 03/16/99	03/17/99 03/16/99
BOTVX6				, ,	, ,	, ., -
% SOLIDS CHROMIUM VI	002 002	S S	99L%S040 99LVI028	03/08/99 03/08/99	03/16/99 03/16/99	03/17/99 03/16/99
BOTVX7						
% SOLIDS CHROMIUM VI	003 003	s s	99L%S040 99LVI028	03/08/99 03/08/99	03/16/99 03/16/99	03/17/99 03/16/99
B0TVX8						
% SOLIDS CHROMIUM VI	004 004	s s	99L%S040 99LVI028	03/09/99 03/09/99	03/16/99 03/16/99	03/17/99 03/16/99
BOTVX9						
% SOLIDS CHROMIUM VI	005 005	s s	99L%S040 99LVI028	03/09/99 03/09/99	03/16/99 03/16/99	03/17/99 03/16/99
BOTVYO						
% SOLIDS CHROMIUM VI CHROMIUM VI CHROMIUM VI CHROMIUM VI	006 006 006 REP 006 MS 006 MSD	\$ \$ \$ \$ \$ \$	991%S040 991VI028 991VI028 991VI028 991VI028	03/09/99 03/09/99 03/09/99 03/09/99	03/16/99 03/16/99 03/16/99 03/16/99	03/17/99 03/16/99 03/16/99 03/16/99 03/16/99
BOTVY1						
% SOLIDS CHROMIUM VI	007 007	S S	99L%S040 99LVI028	03/09/99 03/09/99	03/16/99 03/16/99	03/17/99 03/16/99

LAB QC:

Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-001

DATE RECEIVED: 03/13/99 RFW LOT # :9903L440

CLIENT ID /AN	NALYSIS RFW	# MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
				·		
CHROMIUM VI	MB1	S	99LVI028	N/A	03/16/99	03/16/99
CHROMIUM VI	MB1	BS S	99LVI028	N/A	03/16/99	03/16/99
CHROMIUM VI	MB1	BSD S	99LVI028	N/A	03/16/99	03/16/99

RECRA	LabNet	Use	Only

Custody Transfer Record/Lab Work Request Page __/ of __/

P	RECRA LabNet
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FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

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Est. Final Pro	al Sei	molina i)oto		• •	7- '			pe Contr	siner	Liquid	·						1.5							
Project #	109	85-	601	-001	-999	9-0	<u>O</u>				Solid	1AG	/KG			146			;	ļ				$-\!$	
Project Conta	ct/Ph	10ne #				<u> </u>	·	— Volt	me		Liquid	1 2	ļ			4.5		1	4	ļ	<u> </u>	\dashv			
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Date Rec'd	3-1	13-9	9_	Date Due	3-20	<u>, 99</u>	·		LYSES WESTED	,	-	VOA	_	Pest/ PCB	Herb			Metal	Z Ö						
Account #	T	-					Matrix	-	T						1		RECRA		t Use	Only		1			
MATRIX CODES: S - Solf SE - Sediment SO - Solid SL - Sludge	Lab ID		CII	ient ID/Desc	ription		QC Choser (V)	Mac	ix Coll	ate ected	Time Collected	472	US SH			1CR6		Utow	أز						
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Bechtel Hanford Inc.			IAIN OF CUST	ODY/S	AMPLE	E ANALY	SIS I	REQUEST	Γ	B99	-001-100	Page <u>l</u>	of I
Collector Fahlberg/Kerkow		Compa R Co	iny Contact	Telephor 373-64			ļ	Project Coordi	ator	Price Code		Data Tur	naround
Project Designation 100 BC Areas - Quick Turn			ing Location B/C					SAF No. 399-001				7 [)ays
	-010	Field I	ogbook No.	<u></u>			1	Method of Ship	ment	Fel	41		
Shipped To TMA/RECRA		Offsite	Property No.	AGGO	181			Bill of Lading/	Air Bill !	15233	24		
								COA	RIL	B1126	(U)		
POSSIBLE SAMPLE HAZA	ARDS/REMARKS		Preservation	None	Cool 4C	Cool 4C	Cool 40	None] 		
·			Type of Container	P	aG	aG	aG	aG					
			No. of Container(s)	1	1	1	1	1			1 1		
Special Handling and/or Stor	rage		Volume	20mL	60mL	60mL	60mL	500mL			1 1		·
	SAMPLE ANAI	Lysis		Activity Scan	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - \$26 (TCL)						
	·												
Sample No.	Matrix *	Sample Date	Sample Time	福建						3 30 3 3 3 3 3 3 3 3		To the state of th	
B0TVX5	Soil	3.8.85	1030	ļ	X	1	አ		ļ		tie -	· 130	TVIZ
BOTVX6	Soil	3.8.11	645		え	\\ \tau_{\tau}	×		ļ	_	tict	· Bo	V18
B0TVX7	Soil	3.8.91	1100	<u> </u>	<u>_x</u>	<u>x</u>	x				+in+a	<u> </u>	V19
BOTVX8	Soil	3.8.90	9 0940	ļ	<u>x</u>	_ x	X		ļ		+10+	Ro7	V16
CHAIN OF POSSESSION		Sign/Pri			(n)		10A (SW-		Lead}; Mo	ercury - 7471 - (CV	7);	Matrix Soil Water	*
Relinquished By	Date/Time	Received By		SS 1000	(2)	omium Hex - 71! Gamma Spectros	сору (Се	sium-137, Cobalt-	60, Europa	ium-154, Europium mium-238); Ameri	1-155);	Vapor Other Solid	
Relinquished By	Date/Time	Received By		ate/Time						Total Sr; Nickel-63		Other Liquid	
Relinquished By	Date/Time	Received By	Di	ate/Time	_								
Relinquished By	Date/Time	Received By	Da	ate/Time							}		
LABORATORY Received By SECTION	,	 		Ti	ile				·		D.	ate/Time	
<u> </u>	INAL SAMPLE Disposal Method						sed By	 _			D	ate/Time	

Bechtel Hanfor	d Inc.	C	HAIN OF CUST	rody/s	AMPLI	E ANAL	YSIS	REQUEST		В9	9-001-101	Page <u>1</u>	of 1
Collector Fahlberg/Kerkow		Сотр	oany Contact Coffman	Telephor	ne No.			Project Coordin	ator	Price Code		Data Tu	rnaround
Project Designation 100 BC Areas - Quick Turn	n.	Sampl	ling Location B/C 16-13-2					AF No. 399-001					
Ice Chest No.	96-010	EL_	Logbook No. 1327-2					Method of Ships	11	dul			
Shipped To TMA/RECRA RS 3.9.19		Offsite	e Property No.	AGGOV	181]	Bill of Lading/A	ir Bill N Qろ	5-795	333	¥4	
51	W2							COA					
POSSIBLE SAMPLE HAZ	ARDS/REMARKS		Preservation	None	Cool 4C	Cool 4C	Cool 40	None					
			Type of Container	P	aG	aG	aG	aG					
			No. of Container(s)	1	1	1	ī	1					
Special Handling and/or St	lorage		Volume	20mL	60mL	60mL	60mL	500mL))		
	SAMPLE AN	LAT VEIC		Activity Scan	See item (1) in Special Instructions	Semi-VOA - 8270A (TCL)	VOA - 826 (TCL)	OA See item (2) in Special Instructions.	•				
	,	ALISIS											
Sample No.	Matrix *	Sample Date	Sample Time										
B0T∨X8	Soil	3.9.99	0820		χ	×	X					tic to	130 V31
B0TVX9	Soil	3.9-19	1		x	λ	X						B01132
B0TVY0	Soil	7-5-99	0835		_<	<u>x</u> _	X	_		_		-	ISOTV 33
<u> </u>													
CHAIN OF POSSESSION		Sign/Prin	at Names		i	CIAL INSTR		S 46) {Chromium, L	ead}; Me	rcury - 747! - (C'	v);	Matrix Soil Water	*
Relinguished By Relinguished By	3/3	ate/Time	Chros (2) (Gami	mium Hex - 71 Samma Spectro na Spec - Add-	96 scopy {Ces on {Ameri	ium-137, Cobalt-60 cium-241, Cesium- anium; Strontium-8	, Europii 134, Urar	um-154, Europiun nium-238}; Amer	n-155}; icium-241;	Vapor Other Solid Other Liqui			
Relinquished By	Date/Time	Received By	Da	ate/Time	\dashv								
Relinquished By	Date/Time	Received By	Da	ate/Time									
LABORATORY Received B SECTION	у			Titl	le le						Da	ate/Time	
FINAL SAMPLE Disposal I DISPOSITION	Method	······································		·	Dispo	sed By				Da	ate/Time		

Revision #: Date Initiated: 3/16/99 SAMPLE DISPOSITION RECORD Project ID: 100-BC-1 RM ACT Sampling Event: 100-BC Areas - Quick Turn Laboratory: TMA/RECRA Task Manager: Corpuz, F.M. Sampling Information: Number of Samples: 3 ggf 3 30 99 ID Numbers? BOVX9, BOVY1, BOTVY0, BOTVX9 BOTVY1 Collection Date: 03/09/99 Project Data Use General Laboratory Validation Direction Sample Management Direction Type: Chain of custody problem Description: Chain of custody not signed

Description: Laboratory is to continue with analyses of listed samples. Data will be used as is. Justification: These samples will not be used to verify closure of a waste site; the data are for waste disposal and contaminated soil removal purposes only. **Approval Signatures:** S.J. Trent Project Coordinator (Print/Sign Name) Frank or Compar 3-24-99 F.M. Corpuz Task Manager (Print/Sign Name)

TO CHECK A BOX: Double click the box; select "Default Value - Checked"

SAF: B99-001 OU: 100-BC-1

Task ID: 1

Matrix: Soil

Disposition:

Class:

Issue Background:

Virtual Laboratories Everywhere

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Recra LabNet Philadelphia Analytical Report

Client: TNU HANFORD B99-001

W.O.#: 10985-001-001-9999-00

RFW#: 9903L440

Date Received: 03-13-99

SDG/SAF#: H0354/B99-001

METALS CASE NARRATIVE

1. This narrative covers the analyses of 7 soil samples.

- 2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
- 3. All analyses were performed within the required holding times.
- 4. The cooler temperature has been recorded on the Chain of Custody.
- 5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
- 6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
- 7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
- 8. All ICP Interference Check Standards were within control limits.
- 9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.
- 10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
- 11. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 2 pages.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

Philadelphia Analytical Laboratory

mld/m03-440

3-22-98 Date



METALS METHOD GLOSSARY

	ds are used as reference $3L440$	e for the digestion :	and analysis of	samples cont	tained within this
Leaching Procedure:	13101311131	2 _Other:			
CLP Metals Diges	stion and Analysis M	ethods: _ILM03.	0 _ILM04.0		
Metals Digestion Me	ethods:3005A301 Other:	10A3015302	0A 3050A	305120	0.7 _SS17
	Me	etals Analysis Me	thods	F.D.	
	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	6010B	200.7			99
Antimony	6010B 7041 ⁵	200.7 204.2			— 99
Arsenic	-6010B -7060A ⁵	200.7 206.2	3113B		99
Barium	6010B		<u> </u>		₉₉
Beryllium	6010B				— ₉₉
Bismuth	6010B ¹	200.7 1		1620	99
Boron	6010B	200.7			₉₉
Cadmium	6010B 7131A ⁵	200.7 213.2			9 9
Calcium	6010B	200.7			₉₉
Chromium	6010B 7191 5	200.7 218.2			SS17
Cobalt	6010B	200.7			99
Copper	6010B 7211 ⁵	200.7 220.2			99
Iron	-6910B	200.7			99
Lead	76010B 7421 ⁵	200.7 239.2	3113B		99
Lithium	6010B 7430 ⁴	200.7	_	1620	99
Magnesium	6010B	200. 7			99
Manganese	6010B	200. 7			99
Mercury	7470A ³	245.1 ² 245.5 ²			_99
Molybdenum	6010B	200. 7			99
Nickel	6010B	200. 7			99
Potassium	6010B7610 ⁴	200.7258.1 4			99
Rare Earths	6010B ¹	200.7 1		1620	99
Selenium	6010B7740 ⁵	200.7270.2	311 3 B		⁹⁹
Silicon	6010B ¹	200.7		1620	99
Silica	6010B	200.7		162 0	99
Silver	_6010B _7761 ⁵	200.7272.2			99
Sodium	6010B7770 ⁴	200.7273.1 4			_ ⁹⁹
Strontium	6010B	200.7			99
Thallium	6010B7841 ⁵	200.7279.23	200.9		99
Tin	6010B	200.7			99
Titanium	_6010B	200.7			99
Uranium	6010B ¹	200.7 1		1620	99
Vanadium	_6010B	_200.7			99
Zinc	6010B	200.7			99
Zirconium	6010B ¹	200.7 1		_1620	99

Method:

Other:

L-WI-033/M-03/98

03

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- * = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

ANALYTICAL METAL METHODS

- 1. Not included in the method element list.
- 2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
- Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
- 4. Flame AA
- 5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

INORGANICS DATA SUMMARY REPORT 03/22/99

CLIENT: TNU-HANFORD B99-001

RECRA LOT #: 9903L440

					REPORTING	DILUTION
Sample	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
	***************	3 电平衡 多数 8 名 祖 祖 祖 祖 女 圣 全 章 作 卷 前 祖 崔 S E			****	
-001	BOTVX5	Chromium, Total	8.0	MG/KG	0.46	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	6.5	MG/KG	3.6	1.0
-002	0.000	.				
-002	BOTVX6	Chromium, Total	7.7	MG/KG	0.39	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.1	MG/KG	3.0	1.0
-003	BOTVX7	Chromium, Total	7.8	MG/KG	0.38	1.0
		Mercury, Total	0.02 u		0.02	1.0
		Lead, Total	4.8	MG/KG	2.9	1.0
				·		
-004	BOTVX8	Chromium, Total	11.6	MG/KG	0.34	1.0
		Mercury, Total	0.02 ⴁ	MG/KG	0.02	1.0
		Lead, Total	11.0	MG/KG	2.7	1.0
-005	BOTVX9	Chromium, Total	5.4	MG/KG	0.37	1.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Lead, Total		•		
		Madu, Iotel	2.9 u	MG/KG	2.9	1.0
-006	BOTVYO	Chromium, Total	4.6	MG/KG	0.32	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	2.5 u	MG/KG	2.5	1.0
-007	B0TVY1	Chromium, Total	8.6	MG/KG	0.40	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Lead, Total	3.2	MG/KG	3.1	1.0

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/22/99

CLIENT: THU-HANFORD B99-001

RECRA LOT #: 9903L440

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
		3234-56kkm;;;33-5666m;	******		*******	
BLANK1	99L0172-MB1	Chromium, Total	0.42 u	MG/KG	0.42	1.0
		Lead, Total	3.3 u	MG/KG	. 3.3	1.0
BLANK1	99C0077-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

INORGANICS ACCURACY REPORT 03/22/99

CLIENT: TNU-HANFORD B99-001

RECRA LOT #: 9903L440

			SPIKED	INITIAL	SPIKED		DILUTION	
SAMPLE	SITE ID	ANALYTE	SAMPLE	result	AMOUNT	*RECOV	Factor (SPK)	
		**************************************		****				
-001	BOTVX5	Chromium, Total	27.8	8.0	20.6	96.1	1.0	
		Mercury, Total	0.20	0.024	0.19	101.0	1.0	
		Lead, Total	-55.0	6.5	51.6	94.0	1.0	

INORGANICS PRECISION REPORT 03/22/99

CLIENT: THU-HANFORD B99-001

RECRA LOT #: 9903L440

WORK ORDER: 10985-001-001-9999-00

			INITIAL			DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	REPLICATE	RPD	factor (REP)
*******	**************		******		*****	
-001REP	BOTVX5	Chromium, Total	8.0	7.6	5.1	1.0
		Mercury, Total	0.02u	0.02u	ИĊ	1.0
		Lead, Total	. 6.5	3.5 u	200 مسيخلہ	1.0

Correction

INORGANICS LABORATORY CONTROL STANDARDS REPORT 03/22/99

CLIENT: TNU-HANFORD B99-001 RECRA LOT #: 9903L440

			SPIKED	SPIRED		
SAMPLE	SITE ID	ANALYTE	SAMPLE	AMOUNT	UNITS	%RECOV

LCS1	99L0172-LC1	Chromium, LCS	49.8	50.0	MG/KG	99.6
		Lead, LCS	240	250	MG/KG	96.1
LCS1	99C0077-LC1	Mercury, LCS	1.3	1.2	MG/KG	113.7

Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-001

DATE RECEIVED: 03/13/99 RFW LOT # :9903L440

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOTVX5						
CHROMIUM, TOTAL	001	s	99L0172	03/08/99	03/21/99	03/22/99
CHROMIUM, TOTAL	001 REP	s	99L0172	03/08/99	03/21/99	03/22/99
CHROMIUM, TOTAL	001 MS	s	99L0172	03/08/99	03/21/99	03/22/99
MERCURY, TOTAL	001	S	99C0077	03/08/99	03/17/99	03/18/99
MERCURY, TOTAL	001 REP	s	99C0077	03/08/99	03/17/99	03/18/99
MERCURY, TOTAL	001 MS	S	99C0077	03/08/99	03/17/99	03/18/99
LEAD, TOTAL	001	s	99L0172	03/08/99	03/21/99	03/22/99
LEAD, TOTAL	001 REP	S	99L0172	03/08/99	03/21/99	03/22/99
LEAD, TOTAL	001 MS	S	9910172	03/08/99	03/21/99	03/22/99
BOTVX6						
CHROMIUM, TOTAL	002	s	99L0172	03/08/99	03/21/99	03/22/99
MERCURY, TOTAL	002	S	99C0077	03/08/99	03/17/99	03/18/99
LEAD, TOTAL	002	s	99L0172	03/08/99	03/21/99	03/22/99
BOTVX7						
CHROMIUM, TOTAL	003	s	99L0172	03/08/99	03/21/99	03/22/99
MERCURY, TOTAL	003	S	99C0077	03/08/99	03/17/99	03/18/99
LEAD, TOTAL	003	s	9910172	03/08/99	03/21/99	03/22/99
BOTVX8						
CHROMIUM, TOTAL	004	s	9910172	03/08/99	03/21/99	03/22/99
MERCURY, TOTAL	004	s	99C0077	03/08/99	03/17/99	03/18/99
LEAD, TOTAL	004	s	99L0172	03/08/99	03/21/99	03/22/99
BOTVX9						
CHROMIUM, TOTAL	005	s	9910172	03/09/99	03/21/99	03/22/99
MERCURY, TOTAL	005	S	99C0077	03/09/99	03/17/99	03/18/99
LEAD, TOTAL	005	s	99L0172	03/09/99	03/21/99	03/22/99
B0TVY0						
CHROMIUM, TOTAL	006	S	99L0172	03/09/99	03/21/99	03/22/99

Recra LabNet - Lionville Laboratory INORGANIC ANALYTICAL DATA FACKAGE FOR TNU-HANFORD B99-001

DATE RECEIVED: 03/13/99 RFW LOT # :9903L440

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL LEAD, TOTAL	006 006	s s	99C0077	03/09/99 03/09/99	03/17/99 03/21/99	03/18/99
B0TVY1		_		00, 03, 22		03, 11, 33
CHROMIUM, TOTAL MERCURY, TOTAL	007 007	s s	9910172	03/09/99	03/21/99	03/22/99
LEAD, TOTAL	007	S	99C0077 99L0172	03/09/99 03/09/99	03/17/99 03/21/99	03/18/99 03/22/99
LAB QC:						
CHROMIUM LABORATORY	LC1 BS	s	99L0172	N/A	03/21/99	03/22/99
CHROMIUM, TOTAL	MB1	S	99L0172	N/A	03/21/99	03/22/99
MERCURY LABORATORY	LC1 BS	S	99C0077	N/A	03/17/99	03/18/99
MERCURY, TOTAL	MB1	S	99C0077	N/A	03/17/99	03/18/99
LEAD LABORATORY	LC1 BS	S	99L0172	N/A	03/21/99	03/22/99
LEAD, TOTAL	MB1	S	99L0172	N/A	03/21/99	03/22/99

RECHA Lat	oNet Us	se Only	Custo	dy T	rans	ster	Rec	:ord/l	Lab	VV C	rĸ	не	qu	les	t Pag	ge	⊥of_		1		D	RE	ECR	Δ
99031	44	0		_				ONLY S) Al) La	ECR. bNe	:t
Client _	rechi .	tel/ HAN/	OU TN	M-Has	nfocal	B99-00	Refrige	erator #			3			3			$\overline{1}$							_
Est. Final Pro	ol. Samo						!	Container	Liquid Solid	i.AG	1KG			IAG		,	1	\dashv	$\overline{}$				-	_
Project Conta	, -			<i> </i>		<u></u>	Malara		Liquid		1						V							_
RECRA Proje		<u>^</u>					Volume	a	Solid	40	८०			40			2							_
ac Sou		Del Sole	el TAT_	7 <u>d</u>	ay		Preser	vatives		<u> </u>		1		_		_	7	\downarrow						
Date Rec'd		3-99	Date Due	3-20	,49		ANALY REQUE		-	VOA	ORGA	PCB OIN	Herb			-	Metal Metal	G S						
Account #	<u> </u>					Matrix		1					1		RECR		bNet U	se Or	nly		1			
MATRIX CODES: S - Soil SE - Sediment SO - Solid	Lab ID	CII	llent ID/Descrip	ption		QC Chosen (V)	Matrix	Date Collected	Time Collected	4720	CERSH			1CR6			meta			E				
SL - Sludge W - Water	001	BOTY	5				3	3.4.49	1030	7	7	\neg		7			7			\neg				٦
O - OII A - Air	02	COL Y	1.				1	1 1	1045					7			1						1	٦
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DL - Drum Liquids	004		4				- -	3099		フ	1	$\neg \uparrow$		7			ノ						_	
L EP/TCLP Leachate	185	 	9 .				Π	17	0825					7			7	\top				\top	1	٦
WI - Wipe X - Other F - Fish	206	BoTVY	<u> </u>	 				1	0835	1	7			7			⋌	\top						
F • FISH	207	BOTVV	 _				5	3/1/99	0836	7	V			7			1							٦
	18851																							٦
Special Instructi						DATE/	REVISION	VS:	10	20	ist	4	-0						RECRA	\ LabNi	et Use O	Inly		٦
SAF# Met(1399-0 1 CP mext	•	Jr,Pl	s,Hg	607	M. 513	NS: Orig	nd (ja-	<u>~</u> ,	<u>х</u> (rex Q(<u></u>			1) Shi Hand Airbill 2) Am 3) Rei	Deliyer Bullet Deliyer Deliyed	or Shille		1) Pres Packag 2) Unb Packag	Tape was sent(o) C ge (v) o iroken or ge (v) o sent on S	Outer or N n Outer or N	
								6									4) Lat	bels inc erly Pre	served		Sample	roken or e <i>()</i> or Record P	r N	
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Relinquished by	Received by	Date	Time
tel El	V4-5	3.13.99	1000

Relinguished by	Received by	Date	Time	

Discrepancies Between Samples Labele and COC Record Y or N NOTES: NOTES: 423579523324

5) Received Within Holding Times or N

Cooler 51

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Bechtel Hanford	Inc.	C	HAIN OF CUST	rody/s	AMPL	E ANAL	YSIS !	REQUES	Γ	B99	-001-100	Page 1	of 1
Collector Fahlberg/Kerkow			any Contact offman	Telepho 373-6	ne No. 425			Project Coord TRENT, SJ	nator	Price Code		Data Tı	rnaround
Project Designation 100 BC Areas - Quick Turn			ling Location B/C					SAF No. B99-001				71)ays
Ice Chest No R (96	-010	Field I EL	Logbook No. 1327-2		· · · ·			Method of Shi	oment	Feb	Eul		
Shipped To TMA/RECRA Re- 3.8 49		Offsite	e Property No.	AGGO	\$81		,	Bill of Lading	Air Bill 1	75233	24		
,								COA		e BIIZL			
POSSIBLE SAMPLE HAZAI	RDS/REMARKS		Preservation	None	Cool 4C	Cool 4C	Cool 40	; None					
			Type of Container	P	aG	аĞ	åG	aG					
			No. of Container(s)	1	,1	1	1	1					
Special Handling and/or Stora	ige		Volume	20mL	60mL	60mL	60mL	.1m005				•	
	SAMPLE ANA	LYSIS		Activity Scan	See item (1) in Special Instructions.	Semi-VOA - \$270A (TCL)	VOA - \$26 (TCL)						
											}		
Sample No.	Matrix *	Sample Date	Sample Time										
30TVX5	Soil	3.8.99	1030	<u> </u>	X	X	አ				tie +	. Bo	TVIT
BOTVX6	Soil	3.8.55	645	<u></u>	と	X	X				tie t	. Bos	V18
BOTVX7	Soil	3.8.99	1100	<u> </u>	x	x	x				tieta	Bo	V19
BOTVX8	Soil	3.8.9	3 0940	<u> </u>	X	x	X				tieto		Y16
		<u> </u>		<u> </u>	<u> </u>	1			<u> </u>				
CHAIN OF POSSESSION		Siga/Pri	of Names		1	CLAL INSTR						Matrix Soil	•
elinquished By	Date/Time	Received By		ate/Time	Chr	omium Hex - 71:	96			rcury - 7471 - (C\		Water Vapor	
elinquished By	Date/Time	Received By		ate/Time	Gan	ama Spec - Add-	on (Ameri	cium-241, Cesium	-134, Ura	ium-154, Europium nium-238); Ameri Fotal Sr; Nickel-63	cium-241,	Other Solid Other Liqui	
elinquished By	Date/Time	Received By	D	ate/Time									
Relinquished By	Date/Time	Received By	D	ate/Time							}		
ABORATORY Received By SECTION	_ <u></u>			Ti	ule l						D	ite/Time	
SAMPLE Disposal Me	thod					Dispo	sed Bv					··-•	

Bechtel Hanfor	d Inc.		CHAIN OF CUS	TODY/S	AMPL	E ANAL	YSIS	REQUES	r	В	399-001-101	Page	of 1
Collector Fahlberg/Kerkow		С	ompany Contact R Coffman	Telepho 373-6	ne No. 425			Project Coordi	nator	Price Code		Data T	urnaround
Project Designation 100 BC Areas - Quick Turn	n	Si	ampling Location					SAF No.		{			
Ice Chest No.	0/ 0		100 B/C 116-13 · 2 eld Logbook No.	<u>-</u>	·			B99-001 Method of Ship	ment	0111			
Shipped To	- MQ-01	0	EL 1327-2						11	er ut			
TMA/RECRA	<u> </u>		ffsite Property No.	Aggor	181			Bill of Lading/	123	579	52337	4	
511	165			·			<u></u>	СОА	, - · · · · · ·			,·- <u>-</u>	
POSSIBLE SAMPLE HAZ	.ARDS/REMARF	KS	Preservation	None	Cool 4C	Cool 4C	Cool 4	C None					
			Type of Container	P	aG	aG	aG	aG					
			No. of Container(s)	1	1	1	1	1					T
Special Handling and/or Sto	orage		Volume	20mL	60mL	60mL	60mL	. 500mL					
	SAMPLE	ANALYSIS		Activity Scan	See item (1) in Special Instructions	Semi-VOA - 8270A (TCL)	VOA - 820 (TCL)						1
Sample No.	Matrix *	Sample D	ate Sample Time	Profession S		at we seem to a		And the Management of the Annual Control		***		पूर्ण करू वा करिए । इस्ते क	A the Charles where
B0TVX8	Soil	3.9.0	19 0820		χ	×	X					tic to	BAVSI
B0TVX9	Soil	3.9-	19 0825		x	ኢ	X						1307V32
BOTVY0	Soil	7.9.6	19 0835		_<	<u>x</u>	X				-		ISOV 3
	ļ			!		<u></u>			,		_		
				<u> </u>	SPEC	IAL INSTR	UCTIO	VS.			<u> </u>	Matri	x •
CHAIN OF POSSESSION		<u> </u>	Print Names		(1) I	CP Metals - 60	10A (SW-	846) (Chromium, I	.ead}; Me	гсшгу - 7471 - (6	cv);	Soil Water	
Relinguished By	Date/Time 3 1399 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Received By	313	ate/Time	7 (2) (mium Hex - 71: Samma Spectro	scopy (Ce	sium-137, Cobalt-6	0, Europii	ım-154, Europi	um-155};	Vapor Other Solid	,
Relinquished By	Date/Time	Received By		ate/Time		ma Spec - Add- pic Plutonium;	on (Amer Isotopic U	icium-241, Cesium ranium; Strontium-	-134, Urai 89,90 T	num-238}; Amo otal Sr; Nickel-	encium-241; 63	Other Liqu	
Relinquished By	Date/Time	Received By	Da	nte/Time									
Relinquished By	Date/Time	Received By	Da	tte/Time									
LABORATORY Received By SECTION	у	L		Titl	le le		· . <u>-</u> · .		···		Da	te/Time	
NAL SAMPLE Disposal N	1ethod					Dispos	sed By				Da	te/Time	



Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

#FA 1309

443 **II** 200

Client: TNU-HANFORD B99-001

RFW #: 9903L440

SDG/SAF #: H0354/B99-001

W.O. #: 10985-001-001-9999-00

Date Received: 03-13-99

SEMIVOLATILE

Seven (7) soil samples were collected on 03-08,09-99.

The samples and their associated QC samples were extracted on 03-16,17-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 03-19,22,23-99.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
- 2. All required holding times for extraction and analysis were met.
- 3. Non-target compounds were detected in the samples.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All matrix spike recoveries were within EPA QC limits.
- 6. All blank spike recoveries were within EPA QC limits.
- 7. The method blank 99LE0322-MB1 contained the common laboratory contaminant Bis (2-ethylhexyl)phthalate at a level less than the CRQL.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

som\gorup\data\bna\tnu03440.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 22 pages.

001

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U	**	Compound was analyzed for but not detected. The associated numerical value is the estimated
		sample quantitation limit which is included and corrected for dilution and percent moisture.

- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I = Interference.
- NQ = Result qualitatively confirmed but not able to quantify.
- A = Indicates that a TIC is a suspected aldol-condensation product.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.

mmz\10-94\gloss.bna



GLOSSARY OF BNA DATA

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions

and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

mmz\10-94\gioss.bna



03

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 9903L440 Client: TNU-HANFORD B99-001 Work Order: 10985001001 Page: 1a

	Cust ID:	BOTVX5	;	BOTVX5	i	B0TVX5		BOTVX		BOTVX7		BOTVX	3
Sample	RFW#:	001	Ĺ	001 MS	,	001 MSD	ı	002		003		004	<u>l</u>
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.0	0.0	1.0	10	1.0	0	1.C	0	1.0	0	1.0	00
	Units:	UG/F	(G	UG/K	(G	UG/K	(G	UG/F	(G	UG/K	:G	UG/F	ΚG
	Nitrobenzene-d5	74	%	67	%	71	%	83		62	0,0	70	
Surrogate	2-Fluorobiphenyl	82	ે	73	ે	70	ે	85	ક	68	%	73	%
Recovery	Terphenyl-d14	95	%	80	%	7 6	%	94	%	78	%	81	%
-	Phenol-d5	76	왕	66	%	73	%	82	%	58	%	63	%
	2-Fluorophenol	74	ક	68	એ	72	ૄ	79	%	57	0	64	્ર
	2,4,6-Tribromophenol	79	ક	69	%	73	ે	75) 0	50	%	56	%
========		==== ====	==f1==	=======	=fl=	=== === ==	==f1==		==fl==		=fl=	========	==f1
Phenol		390	U	62	%	65	%	360	U	380	U	360	U
bis(2-Chloro	ethyl)ether	390	U	390	U	390	U	360	U	380	U	360	U
2-Chlorophen	ol	390	U	65	%	69	%	360	U	380	U	360	U
1,3-Dichloro	benzene	390	U	390	U	390	U	360	U	380	U	360	U
1,4-Dichloro	benzene	390	U	60	%	64	%	360	Ū	380	U	360	U
1,2-Dichloro	benzene	390	U	390	U	390	U	360	U	380	U	360	Ū
2-Methylphen	01	390	U	390	U	390	U	360	U	380	U	360	U
2,2'-oxybis(ol 1-Chloropropane)	390	U	390	U	390	U	360	U	380	U	360	Ü
4-Methylphen	ol -n-propylamine	390	U	390	U	390	U	360	U	380	U	360	U
N-Nitroso-di	-n-propylamine	390	U	71	8	82	양	360	U	380	U	360	U
Hexachloroet	hane	390	U	390	U	390	U	360	U	380	IJ	360	U
Nitrobenzene		390	U	390	U	390	U	360	U	380	U	360	U
Isophorone		390	IJ	390	IJ	390	IJ	360	U	380	IJ	360	IJ
2-Nitropheno	1	390	U	390	U	390	U	360	U	380	U	360	U
2,4-Dimethyl	phenol	390	U	390	U	390	U	360	U	380	U	360	U
bis(2-Chloro	ethoxy)methane	390	U	390	U	390	U	360	U	380	U	360	U
2,4-Dichloro	pheno1	390	U	390	U	390	U	360	U	380	U	360	U
1,2,4-Trichle	orobenzene	390	U	65	e e	69	o\o	360	U	380	U	360	U
Naphthalene_		390	Ū	390	U	390	U	360	U	380	IJ	360	U
4-Chloroanil	ine	390	Ü	390	U	390	U	360	U	380	U	360	U
Hexachlorobu	tadiene	390	U	390	U	390	U	360	U	380	U	360	U
4-Chloro-3-m	ethylphenol	390	U	70	%	73	olo	360	U	380	U	360	U
2-Methylnaph	thalene	390	U	390	U	390	U	360	U	380	U	360	U
Hexachlorocy	clopentadiene	390	U	390	U	390	U	360	U	380	U	360	U
2,4,6-Trichle	orophenol	390	U	390	Ū	390	U	360	U	380	U	360	U
2,4,5-Trichle	orophenol	960	U	960	U	960	U	900	U	950	U	900	U
	C PD3 GTD GG 11 1:												

*= Outside of EPA CLP QC limits.

Cust ID:	BOTVX	5	BOTVX5		B0TVX5		DAMERY					
					BUIVAD		B0TVX6		BOTVX7		BOTVX8	8 i
RFW#:	001	L	001 MS		001 MSD		002		003		004	1
2-Chloronaphthalene	390	U	390	U	390	U	360	Ū	380	U	360	U
2-Nitroaniline	960	U	960	U	960	U	900	U	950	Ū	900	U
Dimethylphthalate	_ 390	U	390	U	390	U	360	U	380	Ü	360	_
Acenaphthylene	390	U	390	U	390	U	360	U	380	Ū	360	
2,6-Dinitrotoluene	390	U	390	U	390	U	360	U	380	Ū	360	
3-Nitroaniline		IJ	960	U	960	U	900	U	950	U	900	
Acenaphthene	390	U	72	٥/٥	70	ક	360	Ü	380	U	360	U
2,4-Dinitrophenol	960	U	960	U	960	U	900	Ū	950	Ü	900	U
4-Nitrophenol	960	U	53	٥١٥	55	એ	900	Ū	950	U	900	_
Dibenzofuran	390	U	390	U	390	Ū	360	U	380	Ü	360	Ü
2,4-Dinitrotoluene	_ 390	U	64	%	72	06	360	Ū	380	Ü	360	_
Diethylphthalate	_ 390	U	390	U	390	U	360	U	380	Ü	360	
4-Chlorophenyl-phenylether	390	U	390	Ū	390	Ū	360	Ū	380	Ū	360	
Fluorene		U	390	U	390	U	360	Ū	380	Ū	360	U
4-NILIOaniline	960	U	960	U	960	U	900	U	950	Ü	900	_
4,6-Dinitro-2-methylphenol	960	U	960	U	960	U	900	Ū	950	U	900	
N-Nitrosodiphenylamine (1)	_ 390	U	390	Ü	390	Ū	360	Ū	380	Ū	360	
4-Bromophenyl-phenylether	390	U	390	U	390	U	360	U	380	U	360	Ü
Hexachlorobenzene	390	U	390	U	390	U	360	U	380	Ū	360	_
Pentachlorophenol	960	U	79	%	82	ે	900	U	950	Ū	900	
Phenanthrene	390	U	390	U	390	U	360	U	380	U	360	
Anthracene	390	U	390	U	390	U	360	U	380	U	360	
Carbazole Di-n-butylphthalate	390	U	390	U	390	U	360	U	380	U	360	
Di-n-butylphthalate	390	U	390	U	390	U	360	U	380	U	360	
Fluoranthene	_ 390	U	390	U	390	U	360	U	380	U	360	U
Pvrene	390	U	81	%	75	9,6	360	U	380	U	360	Ū
Butylbenzylphthalate	390	U	390	U	390	U	360	U	380	U	360	Ū
3,3'-Dichlorobenzidine	390	U	390	U	390	U	360	U	380	U	360	Ü
Benzo(a)anthracene	_ 390	U	390	U	390	U	360	U	380	U	360	U
Chrysene	390	U	390	U	390	U	360	U	380	U	360	U
bis(2-Ethylhexyl)phthalate	_ 32	JВ	390	U	390	U	360	U	380	U	360	Ü
Di-n-octyl phthalate	390	U	390	U	390	U	360	U	380	U		Ū
Benzo(b)fluoranthene	390	U	390	U	390	U	360	U	380	U	360	
Benzo(k)fluoranthene	390	U	390	U	390	U	360	U	380	U	360	
Benzo(a)pyrene	390	U	390	U	390	U	360	U	380	Ū	360	
Indeno(1,2,3-cd)pyrene		U	390	U	390	U	360	U	380	Ū	360	
Dibenz(a,h)anthracene	_ 	U	390	U	390	U	360	U	380	Ü	360	U
Benzo(g,h,i)perylene	390	U	390	U	390	U	360	U	380		360	

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

Report Date: 03/23/99 16:18 Page: 2a Client: TNU-HANFORD B99-001 Work Order: 10985001001 RFW Batch Number: 9903L440

	Cust ID:	BOTVX9	9	B0TVY()	B0TVY1		SBLKSH		SBLKSH BS		SBLKSK	
Sample	RFW#:	005	5	006		007		99LE0322-M	в1	99LE0322-M	в1	99LE0330-M	в1
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.0	0.0	1.0	0	1.0	0	1.0	0	1.0	0	1.0	0
	Units:	UG/F	ΚĠ	UG/K	G	UG/K	G	UG/K	:G	UG/k		UG/K	_
	Nitrobenzene-d5	73	%	69	_%	65	%		જે	 79			 %
Surrogate	2-Fluorobiphenyl	80	96	68	olo Olo	73	8	81	90	83	%	69	%
Recovery	Terphenyl-d14	90	ે	81	96	78	%	85	왕	86	00	78	ek ek
1	Phenol-d5	64	o _o	63	%	68	%	81	e e	76	%	64	8
	2-Fluorophenol	63	ક	69	%	70	%	75	90	76	90	66	95
	2,4,6-Tribromophenol	64	%	52	%	74	ક	75	%	81	%	68	%
=== ==== ====		== =====	==f1=	== === =====	==f1=	=======	=f1	=========	=f1	=========	=f1		=f1
Phenol		350	U	360	U	380	U	330	Ū	68	010	330	U
bis(2-Chlore	pethyl)ether	350	U	360	U	380	U	330	Ų	330	U	330	U
2-Chlorophen	nol	350	U	360	U	380	U	330	U	75	%	330	Ü
1,3-Dichlord	benzene	350	U	360	U	380	U	330	U	330	U	330	U
1,4-Dichloro	benzene	350	IJ	360	U	380	IJ	330	U	71	%	330	U
1,2 Dichloro	obenzene	350	U	360	U	380	Ű	330	U	330	U	330	IJ
2-Methylphen	nol	350	U	360	U	380	U	330	U	330	U	330	U
2,2'-oxybis((1-Chloropropane)	350	U	360	U	380	U	330	U	330	IJ	330	U
4-Methylphen	nol	350	U	360	IJ	380	U	330	U	330	U	330	U
N-Nitroso-di	l-n-propylamine	350	U	360	U	380	U	330	U	108	%	330	IJ
Hexachloroet	hane	350	U	360	U	380	IJ	330	U	330	U	330	IJ
Nitrobenzene		350	U	360	U	380	U	330	U	330	U	330	U
Isophorone		350	U	360	U	380	U	330	U	330	U	330	U
2-Nitropheno	01	350	U	360	U	380	U	330	U	330	U	330	U
2,4-Dimethyl	phenol	350	U	360	U	380	U	330	U	330	U	330	U
bis(2-Chlore	pethoxy) methane	350	U	360	U	380	U	330	U	330	U	330	U
2,4-Dichloro	pphenol	350	U	360	U	380	U	330	U	330	U	330	U
1,2,4-Trichl	orobenzene	350	U	360	U	380	U	330	U	83	ક	330	U
Naphthalene_		350	U	360	U	380	U	330	U	330	U	330	U
4-Chloroanil		350	U	360	U	380	U	330	U	330	U	330	U
Hexachlorobu	itadiene	350	U	360	U	380	U	330	U	330	U	330	U
4-Chloro-3-m	nethylphenol	350	U	360	U	380	U	330	U	75	8	330	U
2-Methylnaph	ithalene	350	U	360	U	380	Ū	330	U	330	U	330	U
Hexachlorocy	clopentadiene	350	U	360	U	380	U	330	U	330	U	330	U
2,4,6-Trichl		350	U	360	U	380	U	330	U	330	U	330	U
2,4,5-Trichl		880	U	910	U	960	U	840	U	840	U	840	U
*= Outside o	of EPA CLP QC limits.												

RFW Batch Number: 9903L440			ANFORD B9				<u>k Order: 10</u>	985			Page: 2b	
Cust	ID: BOTVX	9	BOTVY0		B0TVY1		SBLKSH		SBLKSH BS		SBLKSK	
RFV	W#: 00	5	006		007		99LE0322-M	B1	99LE0322-M	В1	99LE0330-N	Æ1
2-Chloronaphthalene	350	U	360	U	380	U	330	U	330	U	330	Ū
2-Nitroaniline	880	U	910	U	960	U	840	U	840	U	840	U
Dimethylphthalate	350	U	360	U	380	U	330	U	330	U	330	U
Acenaphthylene	350	U	360	U	380	U	330	U	330	IJ	330	U
2,6-Dinitrotoluene	350	U	360	U	380	U	330	U	330	U	330	U
3-Nitroaniline	880	U	910	U	960	U	840	U	840	U	840	U
Acenaphthene	2 = 0	U	360	U	380	U	330	U	80	%	330	U
2,4-Dinitrophenol	880	U	910	U	960	U	840	U	840	U	840	U
4-Nitrophenol	880	U	910	U	960	U	840	U	86	%	840	U
Dibenzofuran		U	360	U	380	U	330	U	330	U	330	U
2,4-Dinitrotoluene	350	U	360	U	380	U	330	U	74	%	330	U
Diethylphthalate	350		360	U	380	U	330	U	330	U	330	U
4-Chlorophenyl-phenylether	 350	U	360	U	380	U	330	U	330	U	330	IJ
Fluorene		Ū	360	U	380	U	330	U	330	Ū	330	U
4-Nitroaniline	 880	U	910	U	960	U	840	U	840	U	840	U
4,6-Dinitro-2-methylphenol	880	U	910	U	960	U	840	U	840	U	840	IJ
N-Nitrosodiphenylamine (1)	 350	U	360	U	380	U	330	U	330	U	330	U
4-Bromophenyl-phenylether	350	U	360	U	380	U	330	U	330	U	330	U
Hexachlorobenzene	350	U	360	U	380	U	330	U	330	U	330	U
Pentachlorophenol	880	U	910	U	960	U	840	U	92	양	840	U
Phenanthrene	350	U	360	U	380	Ū	330	U	330	U	330	U
Anthracene	350	U	360	U	380	U	330	U	330	U	330	U
Carbazole	350	U	360	U	380	IJ	330	U	330	U	330	IJ
Di-n-butylphthalate	350	U	360	U	380	IJ	330	U	330	U	330	IJ
Fluoranthene	 350	U	360	IJ	380	U	330	U	330	U	330	U
Pyrene	350	U	360	U	380	U	330	U	84	0,0	330	U
Butylbenzylphthalate	350	U	360	U	380	U	330	U	330	U	330	U
3,3'-Dichlorobenzidine	350	U	360	U	380	U	330	IJ	330	U	330	IJ
Benzo(a) anthracene	350	IJ	360	IJ	380	U	330	U	330	IJ	330	IJ
Chrysene	350	U	360	U	380	U	330	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	 72	JВ	360	U	380	U	22	J	330	U	330	U
Di-n-octyl phthalate	350	U	360	U	380	U	330	U	330	U	330	IJ
Benzo(b)fluoranthene			360	U		U	330	U	330	U	330	
Benzo(k)fluoranthene	350		360	U	380	U		U	330	U	330	
Benzo(a)pyrene			360	Ū		U	330	U	330	U	330	
Indeno(1,2,3-cd)pyrene			360	Ū	380	U	330	U	330	U	330	
Dibenz(a,h) anthracene	350		360	Ū	380	U	330	Ü	330	Ū	330	Ū
Bango (a. b. i) nextlens			260	*1	200	гт	220	r r	230	17	220	

330 U

330 U

330 U

³⁵⁰ U 360 U 380 U Benzo(g,h,i)perylene__ (1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

Client: **TNU-HANFORD B99-001** Work Order: 10985**001**001 Page: 3a

Report Date: 03/23/99 16:18 00

Cust ID: SBLKSK BS Sample RFW#: 99LE0330-MB1 Information Matrix: SOTE D.F.: 1.00 Units: UG/KG Nitrobenzene-d5 77 Surrogate 2-Fluorobiphenyl 82 Terphenyl-d14 Recovery 90 Phenol-d5 8.0 2-Fluorophenol 82 2,4,6-Tribromophenol bis(2-Chloroethy1)ether 330 U 2-Chlorophenol 78 % 1,3-Dichlorobenzene 330 U 1,4-Dichlorobenzene____ 74 % 1,2-Dichlorobenzene 330 U 2-Methylphenol____ 330 U 2,2'-oxybis(1-Chloropropane) 330 U 4-Methylphenol____ 330 U N-Nitroso-di-n-propylamine 97 % Hexachloroethane __ __ 330 U Nitrobenzene____ 330 U Isophorone ____ 330 U 2-Nitrophenol 330 U 2,4-Dimethylphenol_____ 330 U bis(2-Chloroethoxy)methane____ 330 U 2,4-Dichlorophenol_____ 330 U 1,2,4-Trichlorobenzene 83 % Naphthalene____ 330 U 4-Chloroaniline 330 U Hexachlorobutadiene _____

330 U

78 %

330 U

330 U

330 U

840 U

4-Chloro-3-methylphenol

2-Methylnaphthalene_____

Hexachlorocyclopentadiene____

2,4,6-Trichlorophenol____

2,4,5-Trichlorophenol_____

RFW Batch Number: 9903L440

^{*=} Outside of EPA CLP QC limits.

Cust ID: SBLKSK BS

RFW#: 99LE0330-MB1

2-Chloronaphthalene	330			
2-Nitroaniline	840	U		
Dimethylphthalate	330			
Acenaphthylene	330	U		
2,6-Dinitrotoluene	330	U		
3-Nitroaniline	840	U		
Acenaphthene	81	%		
2,4-Dinitrophenol	840	U		
4-Nitrophenol	78	%		
Dibenzofuran	330	U		
2,4-Dinitrotoluene	77	%		
2,4-Dinitrotoluene	330	U		
4-Chlorophenyl-phenylether	330	U		
Fluorene	330	U		
4-Nitroaniline	840	U		
4,6-Dinitro-2-methylphenol	840	U		
N-Nitrosodiphenylamine (1)	330	U		
4-Bromophenyl-phenylether	330	U	•	
Hexachlorobenzene		U		
Pentachlorophenol	94	٩		
Phenant.hrene	330	IJ		
Anthracene	330	U		
Carbazole	330	U		
Di-n-butylphthalate	330	U		
Fluoranthene	330	U		
Pyrene	89	%		
Butylbenzylphthalate	330	U		
3,3'-Dichlorobenzidine	330	U		
Benzo(a) anthracene	330	U		
Chrysene	330	U		
bis(2-Ethylhexyl)phthalate	36	J		
Di-n-octyl phthalate		U		
Benzo(b)fluoranthene	330	U		
Benzo(k)fluoranthene	330	U		
Benzo(a)pyrene	330			
Indeno(1,2,3-cd)pyrene	330	U		
Dibenz(a,h)anthracene	330	U		
Benzo(g,h,i)perylene	330			

^{(1) -} Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

1			
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İ	B0TVX5		
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t			
- 1			

CLIENT SAMPLE NO.

Lab Name: Recra.LabNet Work Order: 10985001001

Client: <u>TNU-HANFORD B99-001</u>

Matrix: (soil/water) SOIL

Lab Sample ID: 9903L440-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A031912

Level: (low/med) LOW

Date Received: 03/13/99

% Moisture: ___13 decanted: (Y/N) __ Date Extracted: 03/16/99

Concentrated Extract Volume: 1000(uL)

Date Analyzed: <u>03/19/99</u>

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) <u>N</u> pH:

CONCENTRATION UNITS:

Number TICs found: <u>5</u>

(ug/L or ug/Kg) <u>UG/KG</u>

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	7.28	100	==== JA
2. 314-40-9	BROMACIL	19.87	80	
3. 4.	UNKNOWN UNKNOWN	22.06 22.57	500 200	
5.	UNKNOWN	24.34	300	:

1F SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT	SAMPLE	NO.
POTTANG		

Lab Name: Recra.LabNet Work Order: 10985001001

B0TVX6

Client: <u>TNU-HANFORD B99-001</u>

Matrix: (soil/water) SOIL Lab Sample ID: 9903L440-002

Sample wt/vol: 30.0 (g/mL) \underline{G} Lab File ID: $\underline{A031913}$

Level: (low/med) LOW Date Received: 03/13/99

% Moisture: ____7 decanted: (Y/N)__ Date Extracted: 03/16/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/19/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

Number TICs found: 2 (ug/L or ug/Kg: UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE UNKNOWN	====== 6.48 22.57	200	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

	CLIENT	SAMPLE	NO.	
1				
İE	30TVX7			

Lab	Name:	Recra.LabNet	Work	Order:	10985001001
-----	-------	--------------	------	--------	-------------

Client: TNU-HANFORD B99-001

Matrix: (soil/water) SOIL Lab Sample ID: 9903L440-003

Sample wt/vol: 30.0 (g/mL) \underline{G} Lab File ID: $\underline{A032214}$

Level: (low/med) LOW Date Received: 03/13/99

% Moisture: ___12 decanted: (Y/N)__ Date Extracted: 03/16/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/22/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) <u>N</u> pH: ____ CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/KG

	I.			1
CAS NUMBER	 COMPOUND NAME	! RT	 EST. CONC.	
=======================================	=====================================	======	=======================================	=====
1.		1		
	l			

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CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

1		 	 	
i	BOTVX8			
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300| JB |

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-001

Matrix: (soil/water) SOIL Lab Sample ID: 9903L440-004

Sample wt/vol: 30.0 (g/mL) \underline{G} Lab File ID: $\underline{A032215}$

Level: (low/med) LOW Date Received: 03/13/99

% Moisture: ____8 decanted: (Y/N) ___ Date Extracted: 03/16/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/22/99

Injection Volume: 2.0 (uL) Dilution Factor: 1.00

UNKNOWN

CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |

22.07

CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

BOTVX9

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD_B99-001

Matrix: (soil/water) SOIL Lab Sample ID: 9903L440-005

Lab File ID: A032216 Sample wt/vol: 30.0 (g/mL) \underline{G}

Level: (low/med) <u>LOW</u> Date Received: <u>03/13/99</u>

% Moisture: 6 decanted: (Y/N) Date Extracted: 03/16/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/22/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) <u>N</u> pH: ____

CONCENTRATION UNITS: Number TICs found: 7 (ug/L or ug/Kg) <u>UG/KG</u>

		İ		
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	: = = = = = = = = = = = = = = = = = =	!=====	=======================================	=====
1.	ALDOL CONDENSATE	5.18	1000	JA
2.	UNKNOWN	5.88	1000	J
3.	ALDOL CONDENSATE	6.69	200	JA
4.	UNKNOWN	7.64	500	J
5.	UNKNOWN	7.96	700	J
6.	UNKNOWN	9.28	900	J
7.	UNKNOWN	9.36	600	J
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

1		 	 	ı
i	B0TVY0			Í

CLIENT SAMPLE NO.

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-001

Matrix: (soil/water) SOIL Lab Sample ID: 9903L440-006

Sample wt/vol: 30.0 (g/mL) \underline{G} Lab File ID: $\underline{A032304}$

Level: (low/med) LOW Date Received: 03/13/99

% Moisture: ____8 decanted: (Y/N)__ Date Extracted: 03/16/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/23/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) \underline{N} pH: _____ CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	 RT	EST. CONC.	
		= ======		=====
1.] 	<u> </u>	

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

	CLIENT	SAMPLE	NO.	
ı				1
i	B0TVY1			1

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-001

Matrix: (soil/water) SOIL Lab Sample ID: 9903L440-007

Sample wt/vol: 30.0 (g/mL) \underline{G} Lab File ID: $\underline{A031905}$

Level: (low/med) LOW Date Received: <u>03/13/99</u>

% Moisture: 13 decanted: (Y/N) Date Extracted: 03/17/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: <u>03/19/99</u>

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) \underline{N} pH: ___ CONCENTRATION UNITS:

Number TICs found: 2 (ug/L or ug/Kg) <u>UG/KG</u>

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	=======================================	=====	=======	=====
1.	UNKNOWN	22.01	80	J
2.	UNKNOWN	22.57	100	JB
				- 1

Recra LabNet - Lionville Laboratory BNA ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-001

DATE RECEIVED: 03/13/99 RFW LOT # :9903L440

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOTVX5	001	S	99LE0322	03/08/99	03/16/99	03/19/99
BOTVX5	001 MS	S	99LE0322	03/08/99	03/16/99	03/22/99
BOTVX5	001 MSD	S	99LE0322	03/08/99	03/16/99	03/22/99
B0TVX6	002	S	99LE0322	03/08/99	03/16/99	03/19/99
BOTVX7	003	S	99LE0322	03/08/99	03/16/99	03/22/99
BOTVX8	004	S	99LE0322	03/08/99	03/16/99	03/22/99
BOTVX9	005	S	99LE0322	03/09/99	03/16/99	03/22/99
B0TVY0	006	S	99LE0322	03/09/99	03/16/99	03/23/99
BOTVY1	007	S	99LE0330	03/09/99	03/17/99	03/19/99
LAB QC:						
SBLKSH	MB1	S	99LE0322	N/A	03/16/99	03/19/99
SBLKSH	MB1 BS	S	99LE0322	N/A	03/16/99	03/19/99
SBLKSK	MB1	S	99LE0330	N/A	03/17/99	03/19/99
SBLKSK	MB1 BS	S	99LE0330	N/A	03/17/99	03/19/99

RECRA Lab	Net Us	se Only	Custo	dy T	ran	sfer l	Rec	ord/l	_ab '	Wo	rk	Rec	ues	st Pa	age	∠ of	_ <u>/</u>		3	_ F	REC	;RA
99031	44	0	FI	IELD PER	SONNI	EL: COM	PLETE	ONLY S	HADED	ARE	AS	(8)	ALL							L	.abl	Net-
Client 6	uehi	tel/Han	OU TN	M-Han	ford	B99-00	Refrige	rator #		1	3		3			ī						
Est. Final Pro	i. Samı	oling Date					1	Container	Liquid		1		, Ac	-	.	1				┿		
Project #/	098	5-601	-001.	- 4999	(-0	0			Solid	/AG	IKG		IAG			7				+		
Project Conta		1					Volume			60	८०		40	++	<u>-</u> -	$\stackrel{>}{\searrow}$			1	1		
RECRA Project	RECRA Project Manager OJ QC Spec Del Std TAT 7 day					Preserv	vatives	+	-	_					3							
uc per	2 1	2 QQ	Date Due	7 74	da	······································	ANALY	eee			ORG					INOF	₹G					
Date Rec'd	3 こに	3-1-1-	Date Due	5-20	-11		REQUE		→	δ	BNA	Pest/ PCB				Metal	8	İ				
Account #		 			i	Matrix		T					,	REC	RA La		Use O	nly	1			
MATRIX CODES: S - Soil SE - Sediment SO - Solid	Lab ID	CI	lient ID/Descri	ription	Ì	QC Chosen (V)	Matrix	Date Collected	Time Collected	4	CLASH		1CRO			meta						
SL - Sludge W - Water	001	BOT VZ	45				3	3-8-49	1030	7	7	-	1			1						
O - Oil A - Air	02	1	6				Ī	1	1045	/	7		/									
Solids	403		7					11	1/00	1	/		/			7						
DL - Drum Liquids L - EP/TCLP	004		\$					30199	,	/						$\sqrt{}$						
Leachate WI - Wipe	W5	1	9.					H_{-}	0825	/	/					\checkmark						
X - Other F - Fish	006	BOTVY	0					L	0835	1	11			4		$\sqrt{}$						
. ,	007	BOTVV	1				5	39/99	0836		V					$\sqrt{}$						
	1883	13-99		- <u>-</u> -										<u> </u>								
																				<u> </u>		
		<u></u>	<u></u>			<u> </u>			<u> </u>	l "										<u> </u>		
Special Instruct						DATE.	/REVISIO	NS: Orig	and C	2C	NH	Kin	\mathcal{Q}			<u></u>		RECRA	LabNet L	lse Only		
SAF	k=	B99-c	001				Mag	1.000	Wright C			Jyn	<u> </u>				nples w Shipped	ere: or		OC Tape		uter
			. 1	4			> 1'-	2. 3. R	N		L	~ (7			Han	id Deliy	ered	, P	ackage	Y) or	N
Met(L) =	1CP me	tals-1	Cr,Y!	2,H1	7 —		3. 1) (7111	ILC	11-1-	XL	X _			Airb	ill # <i>(24</i>	upeler	Р) Unbroke ackage (on C	N
·					•	<i></i>		4			.——					1		or w illed d in Good	3) Present	Sar Or	mple N
								5								Con	adition (or N	4) Unbroke	n on	-
								6									perly Pr	ndicate reserved		ample <i>(</i>		
Relinquished	quished Received Date Time Relinquished by				Received by	C	ate	Tim		iscrepano			F\ •		Or N	U	OC Reco	ple)Re	ic't			
(DE	1/2	73-	313.99	1000			+-	7					amples L OC Reco OTES:	rdZY o	r N		ding Tin		C	looler 🚄	or T	N
Tex 4	-47	1-0-	777					,	\dashv		 	4 I				n (/	•	or N	T	emp. <i>2</i>	<i>I</i>	. °C
			<u>l</u> .						L		L		2357	734	ودن	L T						

Bechtel Hanford	Inc.	C	HAIN OF CUST	ODY/SA	AMPLE	ANALY	YSIS I	REQUEST	r	В99	-001-100	Page <u>1</u>	of 1
Collector Fahlberg/Kerkow		Com	pany Contact Coffman	Telephon 373-64	ie No. 25		IF	Project Coordi	nator	Price Code		Data Tur	
Project Designation 100 BC Areas - Quick Turn			oling Location 0 B/C				-	SAF No. 399-001				7 D	ays
Ice Chest No. 8 (94	-010		Logbook No. 1327-2					Method of Ship	ment	FRI	En		
Shipped To TMA/RECRA RF S-2-9-9		Offsi	te Property No.	AGGOVÍ	181		į	Bill of Lading/	Air Bill !	No. 15233	24		
								COA	RIL	e BILZLE	oUV)		
POSSIBLE SAMPLE HAZA	RDS/REMARKS		Preservation	None	Cool 4C	Cool 4C	Cool 40	. None					
			Type of Container	P	aG	aG	aG	aG					
Special Handling and/or Stor	rage		No. of Container(s) Volume	1 20mL	l 60mL	1 60mL	60mL	1 500mL					
	SAMPLE ANA	LYSIS		Activity Scan	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 826 (TCL)						
Sample No.	Matrix *	Sample Date	e Sample Time	1000					1				
B0TVX5	Soil	3.8.9	1030		X	X	አ				tie.	- BC	TVIZ
B0TVX6	Soil	3.8.55	645		ኢ	メ	_×				tict	· Bo	V18
B0TVX7	Soil	3.8.9	1 1100		x	عد	x				tiet.	Bo	V19
BOTVX8	Soi	3.8.9	9 0940	 	X_	x	×		ļ		+12+	Ro7	V16
CHAIN OF POSSESSION Relinquished By Relinquished By	Date/Time 3/3-55 \0	Sign/P Received By Received By	*~ 5 313	late/Time	(1) Chro (2) (Gam	omium Hex - 71 Gamma Spectro una Spec - Add	010A (SW- 196 oscopy {Ce i-on {Amer	846) (Chromium esium-137, Cobalt ricium-241, Cesiu	-60, Europ m-134, Ur	lercury - 7471 - (C' pium-154, Europiur anium-238}; Amer Total Sr; Nickel-63	n-155}; icium-241;	Matrix Soil Water Vapor Other Solid Other Liqui	
Relinquished By	Date/Time	Received By	D	ate/Time									
Relinquished By	Date/Time	Received By	D	ate/Time									
LABORATORY Received By SECTION	,	<u> </u>		Ī	itle	·						Date/Time	
FINAL SAMPLE Disposal M DISPOSITION	fethod					Dispo	osed By				Ī	Date/Time	

Bechtel Hanford I	Inc.	CF	HAIN OF CUST	ODY/S	AMPL	E ANALY	YSIS I	REQUEST		B99	-001-101	Page 1	of <u>1</u>
Collector			any Contact offman	Telephon 373-64	ie No.			Project Coordii FRENT, SJ	nator P	rice Code	···	Data Tu	rnaround
Fahlberg/Kerkow Project Designation			ing Location	3/3-04	123	-		SAF No.					
100 BC Areas - Quick Turn		100	B/C 116-13-2	-			F	100-998					
Ice Chest No.	96-010		Logbook No. 1327-2				ľ	Method of Ship	men FLL	-41/			
Shipped To TMA/RECRA RS 3.9.19		Offsite	Property No.	Aggoi	581		İ	Bill of Lading/A	ir Bill No.	, 195	1333	14	
51 1	247	•			-			COA					
POSSIBLE SAMPLE HAZAI	RDS/REMARKS		Preservation	None	Cool 4C	Cool 4C	Cool 4C	None					
			Type of Container	P	aG	aG	aG	aG					
	,		No. of Container(s)	1	1	i	1	1					
Special Handling and/or Store	age		Volume	20mL	60mL	60mL	60mL	500mL					
	SAMPLE ANALYS	SIS		Activity Scan	See item (1) Special Instruction	8270A (TCL)	VOA - 826 (TCL)						
Sample No.	Matrix *	Sample Date	Sample Time	The Mark	466	A SHARE	ala:	ia inperio	HELLIC	A PARTY	36.34	a sain ka	a shaketa
B0TVX8	Soil	3.9.99	0820		χ		٨				<u> </u>	tic to	BOTV31
B0TVX9	Soil	3.9-19	0825		X	ኢ	X				ļ		1301V3Z
B0TVY0	Soil	3-5-99	0835		Κ	x	X					<u> </u>	[30TV 33
CHAIN OF POSSESSION		Sign/Pri	nt Names	. L	(1)	ECIAL INSTR	10A (SW-	NS 846) (Chromium,	Lead); Mercu	ry - 7471 - (CV	√);	Matrix Soil Water	
74-4-1	Date/Time 3 13 9 1000	Received By	313	ate/Time	ひ (2) Ga	ımma Spec - Add-	scopy {Ce.	sium-137, Cobalt- icium-241, Cesium	-134, Uraniu	m-238}; Ameri	icium-241;	Vapor Other Solid Other Liqui	
Relinquished By	Date/Time	Received By	<i>Σ</i> μ:	ate/Time	Isc	otopic Plutonium;	Isotopic U	ranium; Strontium	-89,90 Tota	d Sr; Nickel-63		5 II.G. 2.14 II.	-
Relinquished By	Date/Time	Received By	D	ate/Time									
Relinquished By	Date/Time	Received By	Di	ate/Time									
LABORATORY Received By SECTION		<u> </u>		Ti	tle		.				<u>.</u> 1	Date/Time	
FINAL SAMPLE Disposal Me	ethod					Dispo	sed By				İ	Date/Time	

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-001

W.O. #: 10985-001-001-9999-00

RFW#: 9903L440

Date Received: 03-13-99

SDG/SAF #: H0354/B99-001

GC/MS VOLATILE

Seven (7) soil samples were collected on 03-08,09-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 03-17-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
- 2. The required holding time for analysis was met.
- 3. Non-target compounds were detected in these samples.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All matrix spike recoveries were within EPA QC limits.
- 6. All blank spike recoveries were within EPA QC limits.
- 7. The method blank contained the common laboratory contaminants Methylene Chloride and Acetone at levels less than the CRQL.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

som\group\data\ voa\tnu03440.doc

03-26-41

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 19 pages.

GLOSSARY OF VOA DATA

DATA QUALIFIERS

Ų	=	Compound was analyzed for but not detected. The associated numerical value is the estimated
		sample quantitation limit which is included and corrected for dilution and percent moisture.

- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- **D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- 1 = Interference.
- NQ = Result qualitatively confirmed but not able to quantify.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.

mmz\10-94\gloss.voa



GLOSSARY OF VOA DATA

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

 $mmz \ 10-94 \ gloss.voa$



03

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 03/19/99 13:09 Client: TNU-HANFORD B99-001 Work Order: 10985001001 Page: la RFW Batch Number: 9903L440

Cust I	D: BOTVX!	5	BOTVX5	;	BOTVX5		BOTVX6		BOTVX7		BOTVX	3
Sample RFW Information Matri	x: SOIL		001 MS Soil		001 MSD Soil		002 Soil		003 SOIL		004 Soil	
D.F			1.0		1.0		0.98		0.98		1.0	
Unit	s: UG/1	KG	UG/K	(G	UG/K	.G	UG/K	Œ	UG/K	(G	UG/I	KG
Toluene-	d8 104	96	110	0,0	96	ે	100	P6	106	₽ _k	95	0/0
Surrogate Bromofluorobenze	ne 95	%	101	%	89	%	89	%	99	%	90	상
Recovery 1,2-Dichloroethane-	d4 90	8	106	8	98	8	88	%	93	8	80	⁸
	=======================================	==f1=	========	=f1=	=======	= f 1 = =	=== == ====		=== === ===	=f1	=== == ======	==fl
Chloromethane	12	U	12	U	12	U	11	U	11	U	11	U
Bromomethane	12	U	12	U	12	U	11	Ü	11	U	11	U
Vinyl Chloride	12	U	12	U	12	Ū	11	U	11	U	11	U
Chloroethane		U	12	U	12	U	11	U	11	Ü	11	U
Methylene Chloride	6	В	6	В	4	JΒ	4	JВ	5	JB	4	JB
Acetone		В	12	U	12	U	16	В	11	U	13	В
Carbon Disulfide		U	6	U	6	U	6	U	6	U	6	U
1,1-Dichloroethene	6	U	88	%	79	%	6	U	6	U	6	U
1,1-Dichloroethane	6	U	6	U	6	U	6	U	6	U	6	U
1,2-Dichloroethene (total)	6	U	6	U	6	U	6	U	6	U	6	U
Chloroform _		U	6	U	6	U	6	U	6	U	6	U
1,2-Dichloroethane		U	6	U	6	U	6	U	6	U	6	U
2-Butanone		U	12	U	12	U	11	U	11	U	11	U
1,1,1-Trichloroethane	6	U	6	U	6	U	6	U	6	U	6	U
Carbon Tetrachloride	6	U	6	U	6	IJ	6	\mathbf{U}_{ullet}	6	IJ	6	IJ
Bromodichloromethane	6	IJ	6	IJ	6	IJ	6	U	6	IJ	6	IJ
1,2-Dichloropropane	6	U	6	U	6	IJ	6	U	6	U	6	U
cis-1,3-Dichloropropene	6	U	6	U	6	U	6	U	6	U	6	U
Trichloroethene		U	95	₩	85	es es	6	U	6	U	6	U
Dibromochloromethane		U	6	U	6	U	6	U	6	U	6	U
1,1,2-Trichloroethane	 6	U	6	U	6	U	6	U	6	U	6	IJ
Benzene		U	97	%	8.9	2	6	IJ	6	U	6	IJ
Trans-1,3 Dichloroprepene		11	6	U	1.	{ [6	IJ	6	IJ	6	T.F
Bromoform	6	[]	Б	U	É	[]	Ç	[]	6	[]	6	U
4-Methyl-2 pentanone	12	τJ	12	U	10	Ιĵ	11	£1	7. 1	U	1 1	Fi
2-Hexanche		ĪΤ	12	IJ	12	[]	1.1	ΤT	11	U	11	11
Tourachlar roth ne		1.1	5	TT		:1		l i	J.F	1]	6	11
1,1,2,2 Tetrachloroethane	5	U	6	U	+1	1.1	c	U	6	U	6	IJ
Toluene		IJ	99	8	87	نهاد	6	IJ	6	U	6	Ü

^{*=} Outside of EPA CLP QC limits.

RFW Batch Number: 9903L	440 Clie	ent: TNU-	HANFO	ORD B99-00	1	Work C)rder	: 10985001	001	Page: 1k	<u>)</u>		
	Cust ID:	BOTVX5		BOTVX	5	BOTVX5	i	BOTVX6		BOTVX		BOTVX8	5
	RFW#:	001		001 MS	3	001 MSD)	002		003	1	004	_
Chlorobenzene		6	U	96	જ	87	%	6	U	6	U	6	
Ethylbenzene		6	U	6	U	6	U	6	U	6	U	6	U
Styrene		6	U	6	U	6	U	6	U	6	U	6	U
Xylene (total)		6	U	6	U	6	U	6	U	6	U	6	U
*= Outside of EPA CLP Q	C limits.												

Report Date: 03/19/99 13:09 🗘 Client: TNU-HANFORD B99-001 Work Order: 10985001001 Page: 2a RFW Batch Number: 9903L440

C	Cust ID:	BOTVX9		BOTVYO)	B0TVY1		VBLKWW		VBLKWW BS		
Sample	RFW#:	005		006		007		99LVH029-M	в1	99LVH029-M	B1	
-	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		
111101 mac 1011	D.F.:	0.96	2	1.0	nn	1.0	Ω	1.0	0	1.0	0	
	Units:	UG/K		UG/K		UG/K		UG/K		UG/K		
	0.11200.	00,11		00/1		00,11		00,				
Tol	uene-d8	95	%	95	%	97	%	96	0,0	95	%	<u></u>
Surrogate Bromofluoro	benzene	88	왕	89	%	92	%	89	જ	91	%	
Recovery 1,2-Dichloroet	hane-d4	88	%	83	ob	88	%	0.5	. જે	95	૪	
	========	=======	=f1==	=========	=f1=	========	=f1=	======================================	=f1	=========	=f1=	========f1
Chloromethane		10	U	11	U	11	U	10	U	10	U	
Bromomethane	<u> </u>	10	U	11	U	11	U	10	Ü	10	U	
Vinyl Chloride		10	U	11	U	11	U	10	IJ	10	U	
Chloroethane		10	U	11	U	11	U	10	U	10	U	
Methylene Chloride		3	JB	5	JΒ	6	JB	4	J	3	JВ	
Acetone		10	U	11	U	11	Ü	7	J	10	U	
Carbon Disulfide		5	U	6	U	6	U	5	U	5	U	
1,1-Dichloroethene		5	IJ	6	IJ	6	IJ	5	U	81	%	
1,1-Dichloroethane		5	U	6	U	6	U	5	U	5	U	
1,2-Dichloroethene (total)		5	U	6	U	6	U	5	U	5	U	
Chloroform		5	Ū	6	U	6	U	5	U	5	U	
1,2-Dichloroethane		5	U	6	U	6	U	5	U	5	U	
2-Butanone		10	U	11	U	11	U	10	U	10	U	
1,1,1-Trichloroethane_		5	Ų	6	U	6	U	5	U	5	U	
Carbon Tetrachloride		1	J	6	U	6	U	5	U	5	U	
Bromodichloromethane		5	U	6	U	6	U	5	U	5	U	
1,2-Dichloropropane		5	U	6	U	6	U	5	U	5	U	
cis-1,3-Dichloropropene		5	U	6	U	6	U	5	U	5	U	
Trichloroethene		5	U	6	U	6	U	5	U	90	%	
Dibromochloromethane		5	U	6	U	6	U	5	U	5	U	
1,1,2-Trichloroethane		5	U	6	U	6	U	5	U	5	U	
Benzene		5	U	6	U	6	U	5	U	92	9	
Trans-1,3-Dichloropropene		5	U	5	IJ	6	IJ	5	IJ	5	11	
Brownform		5	IJ	6	ĮΊ	\bar{G}	IJ	ř,	ŢĴ	5	1;	
4-Methyl-2-pennsummer		1.0	U	1.3	ĹΙ	11	[]	1(:	[]	1.0	1.	
2-Hexar: ne		1.0	IJ	1 1	IJ	11	ξJ	1.4	11	1.0	[]	
Totals this root less		<u>.</u> 5	IJ	5	11	6]	1.5	<u> </u>	11	Ē,	H	
1,1,2,2-Tetrachlorcethane		5	U	6	U	6	U	5	U	5	U	
Toluene		5	U	6	U	6	IJ	5	U	90	c. څ	

^{*=} Outside of EPA CLP QC limits.

	Cust ID:	BOTVX9		BOTVY0		BOTVY1		VBLKWW		VBLKWW BS			1
	RFW#:	005		006		007	,	99LVH029-M	в1	99LVH029-M	ß1		C
Chlorobenzene		5	U	6	U	6	U	5	U	90	%		=
Ethylbenzene		5	U	6	U	6	U	5	U	5	U		
Styrene		5	Ū	6	U	6	U	5	U	5	U	•	
Xylene (total)		5	U	6	U	6	U	5	U	5	U		

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS SHEET TENTATIVELY IDENTIFIED COMPOUNDS

TENTATIVED TOENTIFIED COMPOC	BOTVX5
Lab Name: Recra.LabNet Contract: 1	!
Lab Code: Recra Case No.:	SAS No.: SDG No.:
Matrix: (soil/water) <u>SOIL</u>	Lab Sample ID: 9903L440-001
Sample wt/vol: 4.80 (g/mL) G	Lab File ID: h031706
Level: (low/med) <u>LOW</u>	Date Received: <u>03/13/99</u>
% Moisture: not dec13	Date Analyzed: 03/17/99
Column: (pack/cap) <u>CAP</u>	Dilution Factor: 1.04
	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>

1	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	 Q
	=======================================	=======================================	======	=========	=====
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1 E

VOLATILE ORGANICS ANALYSIS SHEET TENTATIVELY IDENTIFIED COMPOUNDS

E	EPA	SAMPLE	NO.		
		·		 	

Lab Name: <u>Recra.LabNet</u> Contract:	B0TVX6 10985001001
Lab Code: Recra Case No.:	SAS No.: SDG No.:
Matrix: (soil/water) <u>SOIL</u>	Lab Sample ID: 9903L440-002
Sample wt/vol: 5.10 (g/mL) G	Lab File ID: h031707
Level: (low/med) <u>LOW</u>	Date Received: 03/13/99
% Moisture: not dec7	Date Analyzed: 03/17/99
Column: (pack/cap) <u>CAP</u>	Dilution Factor: 0.980
Number TICs found: _0	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>
CAS NUMBER COMPOUND NA	ME RT EST. CONC. Q

1E VOLATILE ORGANICS ANALYSIS SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA	SAMPLE	NO.
İBOTVA	77	

Lab Name . Bogra LabNet	B0TVX7
Lab Name: Recra_LabNet Contract:	10382001001
Lab Code: Recra Case No.:	SAS No.: SDG No.:
Matrix: (soil/water) <u>SOIL</u>	Lab Sample ID: 9903L440-003
Sample wt/vol: $\underline{5.10}$ (g/mL) \underline{G}	Lab File ID: h031708
Level: (low/med) <u>LOW</u>	Date Received: <u>03/13/99</u>
% Moisture: not dec. <u>12</u>	Date Analyzed: <u>03/17/99</u>
Column: (pack/cap) <u>CAP</u>	Dilution Factor: 0.980
Number TICs found: 1	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
		======	========	=====	
1.	UNKNOWN	12.423	10	J	
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VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA	SAMPLE	NO.

Lab Name: <u>Recra.LabNet</u> Contract	BOTVX8
Lab Code: Recra Case No.:	SAS No.: SDG No.:
Matrix: (soil/water) <u>SOIL</u>	Lab Sample ID: 9903L440-004
Sample wt/vol: 4.90 (g/mL) G	Lab File ID: h031709
Level: (low/med) <u>LOW</u>	Date Received: <u>03/13/99</u>
% Moisture: not dec. <u>8</u>	Date Analyzed: 03/17/99
Column: (pack/cap) <u>CAP</u>	Dilution Factor: 1.02
Number TICs found: <u>Q</u>	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>
CAS NUMBER COMPOUND N	IAME RT EST. CONC. O

1E

VOLATILE ORGANICS ANALYSIS SHEET TENTATIVELY IDENTIFIED COMPOUNDS

1	 	
 RUMAYA		l I

EPA SAMPLE NO.

Lab Name: Recra.Labl	Net Contract: 1 <u>0985</u>	<u>'</u>	0TVX9
Lab Code: Recra	Case No ·	SAS No.:	SDG No.:
			9903L440-005
Matrix: (soil/water)		2	
Sample wt/vol:	<u>5.20</u> (g/mL) <u>G</u>	Lab File ID:	<u>n031718</u>
Level: (low/med)	LOW	Date Received:	03/13/99
% Moisture: not dec	. <u> 6</u>	Date Analyzed:	03/17/99

Column: (pack/cap) <u>CAP</u> Dilu

Dilution Factor: 0,962

ĺ	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
j	=======================================	=======================================	_======		=====
ĺ	1.		j		ĺĺ
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1E VOLATILE ORGANICS ANALYSIS SHEET TENTATIVELY IDENTIFIED COMPOUNDS

	EPA	SAMPLE	NO.		
1				 	
i	BOTV	70			

	BOTVYO
Lab Name: Recra.LabNet Contract:	10985001001
Lab Code: Recra Case No.:	SAS No.: SDG No.:
Matrix: (soil/water) <u>SOIL</u>	Lab Sample ID: 9903L440-006
Sample wt/vol: 5.00 (g/mL) G	Lab File ID: h031711
Level: (low/med) <u>LOW</u>	Date Received: <u>03/13/99</u>
% Moisture: not dec8	Date Analyzed: <u>03/17/99</u>
Column: (pack/cap) <u>CAP</u>	Dilution Factor: 1.00
Number TICs found: <u>0</u>	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=======================================		======	_========	====
1.		l		

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Lab Code: Recra Case No.: ____

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS SHEET TENTATIVELY IDENTIFIED COMPOUNDS

	 BOTVY1
5001001	
SAS No.:	SDG No.:

Lab	Name:	Recra.LabNet	Contract:	10985001001	

Matrix: (soil/water) SOIL Lab Sample ID: 9903L440-007

Sample wt/vol: $\underline{5.00}$ (g/mL) \underline{G} Lab File ID: $\underline{h031712}$

Level: (low/med) LOW Date Received: 03/13/99

% Moisture: not dec. 13 Date Analyzed: 03/17/99

Column: (pack/cap) CAP Dilution Factor: 1.00

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/KG

			·	
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=======================================	=======================================	======	=======================================	=====
1.	SILOXANE	22.253	6	JB
Ì				

Recra LabNet - Lionville Laboratory VOA ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B99-001

DATE RECEIVED: 03/13/99 RFW LOT # :9903L440

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
		-				
B0TVX5	001	S	99LVH029	03/08/99	N/A	03/17/99
BOTVX5	001 MS	S	99LVH029	03/08/99	N/A	03/17/99
B0TVX5	001 MSD	S	9 9LVH 029	03/08/99	N/A	03/17/99
BOTVX6	002	S	99LVH029	03/08/99	N/A	03/17/99
B0TVX7	003	S	99LVH029	03/08/99	N/A	03/17/99
BOTVX8	004	S	99LVH029	03/08/99	N/A	03/17/99
B0TVX9	005	S	99LVH029	03/09/99	N/A	03/17/99
BOTVY0	006	S	99LVH029	03/09/99	N/A	03/17/99
B0TVY1	007	S	99LVH029	03/09/99	N/A	03/17/99
LAB QC:						
VBLKWW	MB1	S	9 9LVH02 9	N/A	N/A	03/17/99
VBLKWW	MB1 BS	S	99LVH029	N/A	N/A	03/17/99

RECRA Lab	Net U	se Only	_ c	Custo	dy T	ran	sfer i	Rec	ord/L	_ab ˈ	Wo	rk	Re	qu	es	t Page.	<i></i> _of		4			REC	RA
99031	44	0	J (31)		ELD PEF	RSONN	EL: COMI	PLETE	ONLY S	HADED	ARE	AS	(8)) At	走					(LabN	1 <u>6</u> 1
Client &	wh	toll			IU Has	Tord	B99-00	Refrige	rator #		l	3			3		Ī						
Est. Final Pro	I. Sam	plina D	ate			<u> </u>			Container	Liquid					4.		12						
Project #/	098	25-	001	-001	9999	7-0	<u>O</u>			Solid	1AG	r K G		/	(AG		-				 	ļ	
Project Conta	,							Volume	•	Liquid	/ 4		}		10		K				 	 	
RECRA Projec			<u>01</u>		-7 I			-		Solid	(e0	८०			40		3	`			┼		
oc Spec	<u></u>	Del	<u> </u>	TAT_	<u>7</u> d	ay_	 _	Preserv		<u> </u>	-	ORG	ANIC		_		INO	RG			┼──		\neg
Date Rec'd	3-L	3-99	9_	Date Due	3-20	,-99		ANALY REQUE		- ►	VOA	BNA	Pest/ PCB	Herb	ļ		Metai	S O					
MATRIX		T					Matrix					··		1		RECRA	_	Use C	nly	Ţ			
CODES: S - Soil SE - Sediment	Lab ID		Cli	ent ID/Descr	iption		QC Chosen (✔)	Matrix	Date Collected	Time Collected	422	ASY	1		CRO		meta	-					ł
SO - Solid SL - Sludge	- 1	-		حج :			MS MSD		- (-	4. 0 .	 >	3						_			+-	-	\dashv
W - Water O - Oll A - Air	00/	BO	TYX	5 -				5	3-8-99	1030	-	-	-				1			_	╁		
DS - Drum Solids	(0)		· · · · · · · · · · · · · · · · · · ·	<u> </u>					 	1045	1				/	·					-	 	\dashv
OL - Drum Liquids	403			_ 7						1/00	1	7			-		 				-		
L - EP/TCLP Leachate	004	 	<u> </u>	<u>—————</u>				 	3 0898	0825	 	/	 		7		1./				+-	1	
WI - Wipe X - Other	W5	 	- 111	_9_				 			1		L- <u>-</u>		/	 				_	+	1	
F - Fish	206	1307						5	3/9/99	0835 0836	 	1			$\frac{2}{\sqrt{2}}$	-	 -`/				+	-	
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	7 77 3	13-74			<u></u>				1		-				-		\vdash			_	+ -		
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Special Instruct	l	<u> </u>					DATE/	REVISIO	NS:			لـــــــــــــــــــــــــــــــــــــ		- 0			1		RECRA	LabNet L	Jse On	<u></u> -	===
SAF \$		729	9 ~	~ 1			——————————————————————————————————————	>	1. Orig	end (60	KOT	Oly	rex			- Sa	mples w	vere:/	С	OC Tap	e was:	
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MetC) =	ICF	mex	als-	CriP	b, H	9 —	-	3. KL	<u>m M</u>	a		X	Ω	_		Air	ыі #5	0	2 P	Unbro ackage	ken on O	uter N
						`		= <u></u>	4.	-							- 3)	Receive	d in Goo	d) Prese	nt on San or	nple N
									5	· 	<u>-</u> -					- -			or (Indicate	- 7	Unbro		.
	<u>, , , , , , , , , , , , , , , , , , , </u>				,	J			6		:= :								reserved	^		€) or 1 cord Pres	
Relinquished by		Rece	eived X	Date	Time	Rel	inquished by		Received by	C	ate	Tim	ie			s Between Dels and	5)	Receive	or □ d Within			mple/Rec	c't
L. VEL	1/4		5	31399	1000				····					COC F	Record	OL N	•	lding Ti		N C	ooler .	5.1	
- Line -	1		· · · · · ·					1								<i>3523</i> 3	324		·	Т	emp. 🗻	<i></i> .	C

Bechtel Hanford	Inc.	C	HAIN OF CUST	ODY/SA	AMPL:	E ANALY	'SIS	REQUEST		B99-	-001-100	Page 1	of <u>1</u>
Collector Fahlberg/Kerkow			pany Contact Coffman	Telephon 373-64				Project Coordina	tor	Price Code		Data Tu	rnaround
Project Designation 100 BC Areas - Quick Turn			oling Location 0 B/C	<u></u>		''		SAF No. B99-001				7 [)ays
lce Chest No. O (C)	-010		Logbook No. 1327-2		Method of Shipment			4.1					
Shipped To TMA/RECRA RF 3.849			14 D	A9900	181			Bill of Lading/Al		5233	24		
,								COA	216	131126	UV)		
POSSIBLE SAMPLE HAZA	ARDS/REMARKS		Preservation	None	Cool 4C	Cool 4C	Cool 4	C None					
			Type of Container	P	aG	aG	aG	aG					
			No. of Container(s)	1	1	i	i	1	-				
Special Handling and/or Sto	rage		Volume	20mL	1m09	60mL	60mI	. 500mL					,
	SAMPLE ANA	LYSIS	. 	Activity Scan	See item (1) Special Instruction	8270A (TCL)	VOA - 82 (TCL						
Sample No.	Matrix •	Sample Date	Sample Time	TENNYA VOZA			and the said		and the second			(4.55 to 10.55)	
BOTVX5	Soil	3.8.9		42.74	X	~	λιουου λ	Man Sanda Indiana	. بياد لد .	The same of the same			דועו
BOTVX6	Soil	3 8 11			x	7	<u> </u>				tie t		1 1/18
B0TVX7	Soil	3.8.9			r	ير	7			_	tiet		V19
BOTVX8	Soil	3.8.4			X	_ X_	74				tiete	\	V16
	<u> </u>		<u> </u>	1	 SPI	ECIAL INSTR	UCTIO	NS			<u>} </u>	Matri	x •
CHAIN OF POSSESSION Relinquished By Relinquished By	Date/Time 3 13.55 10 Date/Time	Received By Received By	Km - 313	ate/Time	(2) Ga	nomium Hex - 719 Gamma Spectro muna Spec - Add-	96 scopy (C on (Ame	-846) {Chromium, Lo esium-137, Cobalt-60 ricium-241, Cesium- Jranium; Strontium-8	, Europi 134, Urai	um-154, Europium nium-238); Ameri	ı-155}; cium-241;	Soil Water Vapor Other Soli Other Liqu	
Relinquished By	Date/Time	Received By	D	ate/Time									
Relinquished By	Date/Time	Received By	D	ate/Time						·			
LABORATORY Received B SECTION	у			Ti	tie							Date/Time	····
FINAL SAMPLE Disposal DISPOSITION	Method					Dispo	sed By					Date/Time	-

Bechtel Hanford	Inc.	CI	HAIN OF CUST	- ΓODY/S.	AMPL	E ANAL	YSIS I	REQUEST	r	B99	9-001-101	Page 1	of 1_€	
Collector Fahlberg/Kerkow			any Contact	Telephor 373-64	1e No.			Project Coordi	nator	Price Code		Data Tu	Irnaround	
Project Designation			oilman ing Location	3/3-04	125	· · · · · · · · · · · · · · · · · · ·	1	TRÊNT, SJ SAF No.		•			Indiana	
100 BC Areas - Quick Turn		100	B/C 116-13-2	- 		·	Į.	399-001	\					
Ice Chest No.	96-00	ELI	Logbook No. 1327-2					Method of Ship	12	d'ail			-	
Shipped To TMA/RECRA 2 3.9.19		Offsite	Property No.	Agaol	181		i	Bill of Lading/	Air Bill N 入ろ	· , , , , ,	5195123334			
51 1	0'7			···				COA					<u> </u>	
POSSIBLE SAMPLE HAZAI	RDS/REMARKS		Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
			Type of Container	P	aG	aG	aG	aG						
			No. of Container(s)	i	1	1	1	t		_	1			
Special Handling and/or Stora	age		Volume	20mL	60mL	60mL	60mL	500mL	i					
	SAMPLE ANAI	LYSIS		Activity Scan	See item (1) in Special Instructions	8270A (TCL)	VOA - 826 (TCL)	OA See item (2) in Special Instructions	-				 	
						·								
Sample No.	Matrix *	Sample Date	Sample Time	18.88					KELLS			表现图像		
B0TVX8	Soil	3.9.99	0820		χ	×	X					tic to	130 V31	
B0T√X9	Soil	3.9-99	0825		к	ኢ	X						1307 V 32	
B0TVY0	Soil	3:5.99	0835		_ <	X	X						130TV 33	
				<u> </u>	<u> </u>					-				
CHAIN OF POSSESSION		Sign/Prin	it Names		(1)		10A (SW-8	S 46) (Chromium, I	ead}; Mer	cury - 7471 - (C\	/);	Matrix Soil Water	•	
Relinguished By	Date/Time 3 13:79 1000	Received By	() ,	ate/Time }9)00	ر (2) ا	omium Hex - 719 Gamma Spectros	scopy (Ces	ium-137, Cobalt-6	50, Europiu	m-154, Europiun	n-155};	Vapor		
Relinquished By	Date/Time	Received By		ate/Time	Gam	nma Spec - Add-o	on (Americ	cium-241, Cesium anium; Strontium-	-134, Uran:	ium-238); Ameri	icium-241,	Other Solid Other Liquid		
Relinquished By	Date/Time	Received By	Da	ate/Time	\neg									
Relinquished By	Date/Time	Received By	Da	ate/Time										
LABORATORY Received By SECTION				Tit	le			 .			D	ate/Time		
FINAL SAMPLE Disposal Met DISPOSITION	thod					Dispos	sed By	 .	·		D	ate/Time		

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Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0354 is comprised of three solid (soil) samples designated under SAF No. B99-001 with a Project Designation of: 100 BC Areas - Quick Turn.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist. There was a quich turn-around time requiement for gamma spec, isotopic plutonium, and total strontium. Isotopic uranium, isotopic plutonium, total strontium, and gamma spectroscpy data was sent by facsimile on March 22. A complete set of data was sent by facsimile on March 30, 1999.

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analyses

No problems were encountered during the processing of the samples.

2.2 Total Strontium Analyses

The aliquot for the analysis was reduced for expeditious sample preparation. The resultant increased MDA's reflect the decreased aliquot.

2.3 Isotopic Uranium Analyses

The aliquot for the analysis was reduced for expeditious sample preparation. The resultant increased MDA's reflect the decreased aliquot.

2.4 Isotopic Plutonium Analyses

The aliquot for the analysis was reduced for expeditious sample preparation. The resultant increased MDA's reflect the decreased aliquot.

2.5 Americium-241 Analyses

The aliquot for the analysis was reduced for expeditious sample preparation. The resultant increased MDA's reflect the decreased aliquot.

2.6 Gamma Scan Analyses

No problems were encountered during the processing of the samples.

SAMPLE DELIVERY GROUP H0354

SDG 7705
Contact L.A. Johnson

SAMPLE SUMMARY

Client <u>Hanford</u>

Contract TRB-SBB-207925

Case no SDG-H0354

CLIENT SAMPLE ID	LOCATION	MATRIX LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
BOTVX5	100 B/C	SOLID	N903058-01	B99-001	B99-001-100	03/08/99 10:30
BOTVX6	100 B/C	SOLID	N903058-02	B99-001	B99-001-100	03/08/99 10:45
BOTVX8	100 B/C	SOLID	N903058-03	B99-001	B99-001-100	03/08/99 09:40
BOTVX9	100 B/C	SOLID	N903058-04	B99-001	B99-001-101	03/08/99
BOTVYO	100 B/C	SOLID	N903058-05	B99-001	B99-001-101	03/09/99 08:20
B0TVY1	100 B/C	SOLID	N903058-06	B99-001	B99-001-101	03/09/99 08:35
Method Blank		SOLID	N903058-08	B99-001		
Lab Control Sample		SOLID	N903058-07	B99-001		
Duplicate (N903058-01)	100 B/C	SOLID	N903058-09	B99-001		03/08/99 10:30

SAMPLE SUMMARY
Page 1

SUMMARY DATA SECTION

Page 3

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CS

Version 3.06

Report date 03/30/99

SAMPLE DELIVERY GROUP H0354

SDG 7705
Contact L.A. Johnson

QC SUMMARY

Client Hanford

Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0354</u>

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	t SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS S		LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7705	B99-001-100	B0TVX5	SOLID	88.9			03/13/99	5	N903058-01	7705-001
		BOTVX6	SOLID	91.4			03/13/99	5	N903058-02	7705-002
		BOTVX8	SOLID	87.1			03/13/99	5	N903058-03	7705-003
	B99-001-101	BOTVX9	SOLID	92.8			03/13/99	5	N903058-04	7705-004
		BOTVYO	SOLID	92.5			03/13/99	4	N903058-05	7705-005
		B0TVY1	SOLID	87.9			03/13/99	4	N903058-06	7705-006
		Method Blank	SOLID	-					N903058-08	7705-008
		Lab Control Sample	SOLID						N903058-07	7705-007
		Duplicate (N903058-01)	SOLID	88.9			03/13/99	5	N903058-09	7705-009

QC SUMMARY

Page 1

SUMMARY DATA SECTION

Page 4

Lab id TMANC
Protocol Hanford

Version Ver 1.3
Form DVD-QS
Version 3.06

Report date 03/30/99

SAMPLE DELIVERY GROUP H0354

SDG	7705		
Contact	L.A.	Johnson	

PREP BATCH SUMMARY

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0354</u>

			PREPARATIO			PLANCHETS ANALYZED				QUALI-	
TEST	MATRIX	METHOD	BATCH	2σ %	CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG MS/ORIG	FIERS
Alpha	Spectros	сору									
AM	SOLID	Americium 241 in Soil	2851-024	5,0	é			1	1	1/1	
PU	SOLID	Plutonium, Isotopic in Solids	2851-024	5.0	6			1	1	1/1	
U	SOLID	Uranium, Isotopic in Soil	2851-024	5.0	6			1	1	1/1	
Beta	Counting										
SR	SOLID	Total Strontium in Soil	2851-024	10.0	6			1	1	1/1	
Gamma	Spectros	сору									
G AM	SOLID	Gamma Scan	2851-024	15.0	6			1	1	1/1	
Liqui	d Scintil	lation Counting									
NI_L	SOLID	Nickel 63 in Soil	2851-024	10.0	6			1	1	1/1	

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

PREP BATCH SUMMARY

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SAMPLE DELIVERY GROUP H0354

SDG 7705
Contact L.A. Johnson

WORK SUMMARY

Client <u>Hanford</u>

Contract TRB-SBB-207925

Case no SDG-H0354

CLIENT SAMPLE LOCATION CUSTODY	ID SAF No	MATRIX	LAB SAMPLE ID COLLECTED RECEIVED	PLANCHET	TEST	SUF-	ANALYZED	REVIEWED	ву	METHOD
BOTVX5			N903058-01	7705-001	AM		03/23/99	03/30/99	NJV	Americium 241 in Soil
100 B/C		SOLID	03/08/99	7705-001	GAM	-	03/18/99	03/22/99	NJV	Gamma Scan
B99-001-100	B99-001		03/13/99	7705-001	NI_L		03/25/99	03/30/99	NJV	Nickel 63 in Soil
				7705-001	PU		03/19/99	-03/22/99	NJV	Plutonium, Isotopic in Solids
				7705-001	SR		03/19/99	03/22/99	NJV	Total Strontium in Soil
				7705-001	Ū		03/20/99	03/22/99	VĮV	Uranium, Isotopic in Soil
BOTVX6			N903058-02	7705-002	AM		03/23/99	03/30/99	NJV	Americium 241 in Soil
100 B/C		SOLID	03/08/99	7705-002	GAM		03/18/99	03/22/99	NJV	Gamma Scan
B99-001-100	B99-001		03/13/99	7705-002	NI_L		03/25/99	03/30/99	NJV	Nickel 63 in Soil
				7705-002	PU		03/19/99	03/22/99	VUN	Plutonium, Isotopic in Solids
				7705-002	SR		03/19/99	03/22/99	NJV	Total Strontium in Soil
				7705-002	Ū		03/20/99	03/22/99	VLN	Uranium, Isotopic in Soil
BOTVX8			N903058-03	7705-003	AM		03/23/99	03/30/99	NJV	Americium 241 in Soil
100 B/C		SOLID	03/08/99	7705-003	GAM		03/18/99	03/22/99	VĮV	Gamma Scan
B99-001-100	B99-001		03/13/99	7705-003	NI_L		03/25/99	03/30/99	NJV	Nickel 63 in Soil
				7705-003	PU		03/21/99	03/22/99	VLN	Plutonium, Isotopic in Solids
				7705-003	SR		03/19/99	03/22/99	VUM	Total Strontium in Soil
				7705-003	U		03/20/99	03/22/99	VLN	Uranium, Isotopic in Soil
BOTVX9			N903058-04	7705-004	MA		03/23/99	03/30/99	VLN	Americium 241 in Soil
100 B/C		SOLID	03/08/99	7705-004	GAM		03/18/99	03/22/99	NJV	Gamma Scan
B99-001-101	B99-001		03/13/99	7705-004	NI_L		03/25/99	03/30/99	NJV	Nickel 63 in Soil
				7705-004	PU		03/20/99	03/22/99	NJV	Plutonium, Isotopic in Solids
				7705-004	SR		03/19/99	03/22/99	NJV	Total Strontium in Soil
				7705-004	Ü		03/20/99	03/22/99	NJV	Uranium, Isotopic in Soil
BOTVYO			N903058-05	7705-005	AM		03/23/99	03/30/99	VLN	Americium 241 in Soil
100 B/C		SOLID	03/09/99	7705-005	G AM		03/18/99	03/22/99	NJV	Gamma Scan
B99-001-101	B99-001		03/13/99	7705-005	NI_L		03/25/99	03/30/99	NJV	Nickel 63 in Soil
				7705-005	PU		03/20/99	03/22/99	VUN	Plutonium, Isotopic in Solids
				7705-005	SR		03/19/99	03/22/99	VŲN	Total Strontium in Soil
				7705-005	ប		03/20/99	03/22/99	NJV	Uranium, Isotopic in Soil

WORK SUMMARY

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Lab id TMANC

Protocol Hanford

Version Ver 1.3

Form DVD-CWS

Version 3.06

Report date 03/30/99

SAMPLE DELIVERY GROUP H0354

SDG 2705
Contact L.A. Johnson

WORK SUMMARY, cont.

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0354</u>

		MATRIX	LAB SAMPLE II COLLECTED)		SUF-				
CUSTODY	SAF No		RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
B0TVY1			N903058-06	7705-006	AM		03/23/99	03/30/99	NJV	Americium 241 in Soil
100 B/C		SOLID	03/09/99	7705-006	GAM	-	03/19/99	03/22/99	VLN	Gamma Scan
B99-001-101	B99-001		03/13/99	7705-006	NI_L		03/25/99	03/30/99	NJV	Nickel 63 in Soil
				7705-006	PU		03/20/99	-03/22/99	NJV	Plutonium, Isotopic in Solids
				7705-006	SR		03/19/99	03/22/99	NJV	Total Strontium in Soil
				7705-006	U		03/20/99	03/22/99	NJV	Uranium, Isotopic in Soil
Method Blank			N903058-08	7705-008	AM		03/23/99	03/30/99	NJV	Americium 241 in Soil
		SOLID		7705-008	GAM		03/19/99	03/22/99	NJV	Gamma Scan
	B99-001			7705-008	NI_L		03/25/99	03/30/99	NJV	Nickel 63 in Soil
				7705-008	PU		03/20/99	03/22/99	VLN	Plutonium, Isotopic in Solids
				7705-008	SR		03/19/99	03/22/99	NJV	Total Strontium in Soil
				7705-008	U		03/20/99	03/22/99	NJV	Uranium, Isotopic in Soil
Lab Control	Sample		N903058-07	7705-007	MA	·	03/23/99	03/30/99	NJV	Americium 241 in Soil
		SOLID		7705-007	GAM		03/19/99	03/22/99	NJV	Gamma Scan
	B99-001			7705-007	NI_L		03/25/99	03/30/99	NJV	Nickel 63 in Soil
				7705-007	PU		03/20/99	03/22/99	NJV	Plutonium, Isotopic in Solids
				7705-007	SR		03/19/99	03/22/99	NJV	Total Strontium in Soil
				7705-007	U		03/20/99	03/22/99	NJV	Uranium, Isotopic in Soil
Duplicate (N	903058-01)		N903058-09	7705-009	AM	**	03/23/99	03/30/99	NJV	Americium 241 in Soil
100 B/C		SOLID	03/08/99	7705-009	GAM		03/19/99	03/22/99	VUN	Gamma Scan
	B99-001		03/13/99	7705-009	NI_L		03/25/99	03/30/99	VUN	Nickel 63 in Soil
				7705-009	PU		03/20/99	03/22/99	VŲN	Plutonium, Isotopic in Solids
				7705-009	SR		03/19/99	03/22/99	VUN	Total Strontium in Soil
				7705-009	U		03/20/99	03/22/99	ИJV	Uranium, Isotopic in Soil

WORK SUMMARY

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Lab id TMANC

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Report date 03/30/99

SAMPLE DELIVERY GROUP H0354

SDG	7705		
Contact	L.A.	Johnson	

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0354

TEST	SAF No	COUNTS OF	TESTS REFERENCE	BY SAMPLE TYPE CLIENT MORE	RE BLANK	LCS	DUP SPIKE	TOTAL
AM	B99-001	Americium 241 in Soil	AM/CMPLATE	_ 6	1	1	1	9
GAM	B99-001	Gamma Scan	GAMMAHI	6	1	1	1	9
NI_L	B99-001	Nickel 63 in Soil	NI63LSC	6	1	1	1	9
PU	B99-001	Plutonium, Isotopic in Solids	PUPLATE	6	1	1	1	9
SR	B99-001	Total Strontium in Soil		6	1	1	1	9
U	B99-001	Uranium, Isotopic in Soil	UPLATE	6	1	1	1	9
TOTALS				36	6	6	6	54

WORK SUMMARY

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Lab id TMANC

Protocol Hanford

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Report date 03/30/99

N903058-08

METHOD BLANK

Method Blank

	7705 L.A. Johnson	Client/Case no Case no	Hanford TRB-SBB-207925	SDG-H0354
Lab sample id Dept sample id		Client sample id Material/Matrix SAF No		SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.053	0.071	0.14	0.30	U	U
Uranium 235	15117-96-1	0	0.043	0.16	0.30	U	U
Uranium 238	U-238	0.035	0.036	0.14	0.30	U	U
Plutonium 238	13981-16-3	0.732	0.10	0.024	0.050		ΡÜ
Plutonium 239/240	PU-239/240	0.765	0.11	0.028	0.050		PU
Nickel 63	13981-37-8	-0.305	1.2	2.0	20	U	NI_L
Americium 241	14596-10-2	0.002	0.012	0.019	0.050	U	AM
Total Strontium	SR-RAD	-0.068	0.32	0.60	1.0	U	SR
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 134	13967-70-9	Ŭ		0.020		U	GAM
Cesium 137	10045-97-3	U		0.018	0.050	U	GAM
Europium 152	14683-23-9	U		0.046	0.10	U	GAM
Europium 154	15585-10-1	ט		0.050	0.10	U	GAM
Europium 155	14391-16-3	U		0.034	0.10	U	GAM
Americium 241	14596-10-2	U		0.019		U	GAM
Uranium 238	U-238	U		1.9		U	GAM
Uranium 235	15117-96-1	U		0.060		U	GAM

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METHOD BLANKS

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Lab id TMANC

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Report date 03/30/99

SAMPLE DELIVERY GROUP H0354

N903058-07

LAB CONTROL SAMPLE

Lab Control Sample

SDG <u>7705</u> Contact <u>L.A. Johnson</u>	Client/Case no Hanford SDG-H0354 Case no TRB-SBB-207925
Lab sample id <u>N903058-07</u>	Client sample id Lab Control Sample
Dept sample id <u>7705-007</u>	Material/MatrixSOLID_
	SAF No <u>B99-001</u>

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC ∜	3σ LMTS (TOTAL)	PROTOCOI LIMITS
Uranium 233/234	4.57	0.70	0.35_	0.30		Ū.	4.75	0.19	96	76-124	80-120
Uranium 235	3.88	0.64	0.12	0.30		U	3.89	0.16	100	73-127	80-120
Uranium 238	5.27	0.76	0.34	0.30		U	4.90	0.20	108	75-125	80-120
Plutonium 238	5.14	0.51	0.052	0.050	В	PU	5.04	0.20	102	82-118	80-120
Plutonium 239/240	5.26	0.52	0.038	0.050	В	PU	5.29	0.21	99	82-118	80-120
Nickel 63	134	3.6	2.0	20		NI_L	134	5.4	100	83-117	
Americium 241	4.47	0.31	0.019	0.050		AM	4.80	0.19	93	87-113	80-120
Total Strontium	11.6	0.63	0.26	1.0		SR	11.5	0.46	101	82-118	
Cobalt 60	0.252	0.034	0.022	0.050		GAM	0.308	0.012	82	75-125	80-120
Cesium 137	0.342	0.031	0.022	0.050		GAM	0.348	0.014	98	73-127	80-120

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QC-LCS 30326			

LAB CONTROL SAMPLES

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SAMPLE DELIVERY GROUP H0354

DUPLICATE

BOTVX5

SDG <u>7705</u> Contact <u>L.A. Johnson</u>	-	Client/Case no <u>Hanford</u> <u>SDG-H0354</u> Case no <u>TRB-SBB-207925</u>
DUPLICATE	ORIGINAL	
Lab sample id <u>N903058-09</u>	Lab sample id <u>N903058-01</u>	Client sample id BOTVX5
Dept sample id <u>7705-009</u>	Dept sample id 7705-001	Location/Matrix 100 B/C SOLID
	Received 03/13/99	Collected 03/08/99 10:30
% solids <u>88.9</u>	% solids <u>88.9</u>	Custody/SAF No <u>B99-001-100</u> <u>B99-001</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-	RPD	3σ PROT TOT LIMIT
Uranium 233/234	0.681	0.30	0.27	0.30		ט	0.629	0.26	0.24		8	92
Uranium 235	0.087	0.087	0.33	0.30	Ŭ	U	0.114	0.15	0.29	Ŭ	-	
Uranium 238	0.824	0.37	0.27	0.30		U	0.597	0.26	0.24		32	96
Plutonium 238	O	0.13	0.31	0.050	U	PU	0	0.20	0.44	U	-	
Plutonium 239/240	1.85	0.53	0.31	0.050	В	PU	2.18	0.62	0.44	В	16	62
Nickel 63	-0.704	1.4	2.4	20	U	NI_L	-0.467	1.4	2.4	U	-	
Americium 241	0.352	0.080	0.033	0.050		AM	0.417	0.087	0.032		17	47
Total Strontium	33.4	2.9	2.0	1.0		SR	39.3	2.6	1.9		16	27
Potassium 40	13.5	1.0	0.50			GAM	8.24	1.6	1.0		48	42
Cobalt 60	0.071	0.049	0.056	0.050		GAM	U		0.16	U	77	220
Cesium 134	U		0.084		U	GAM	Ū		0.19	U	-	
Cesium 137	25 2	1.0	0.25	0.050		GAM	248	1.6	0.53		2	32
Europium 152	1.90	0.64	0.93	0.10		GAM	U		2.0	U	5	165
Europium 154	U		0.22	0.10	U	GAM	U		0.47	U	-	
Europium 155	Ū		0.64	0.10	Ū	GAM	U		1.2	ū	-	
Radium 226	0.376	0.28	0.38	0.10	U	GAM	Ü			J	1	190
Radium 228	0.816	0.27	0.29	0.20		GAM	U			J	95	113
Thorium 228	0.538	0.30	0.44			GAM	U				20	166
Thorium 232	0.816	0.27	0.29			GAM	U				95	113
Americium 241	U		0.58		U	GAM	U		0.56	U	-	
Uranium 238	U		7.7		υ	GAM	U		17	U	-	
Uranium 235	U		0.99		U	GAM	U		2.1	Ü	-	

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Lab id TMANC

Protocol Hanford

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Form DVD-DUP

Version 3.06

Report date 03/30/99

N903058-01

DATA SHEET

BOTVX5

SDG	7705	Client/Case no	Hanford	SDG-H0354
Contact	L.A. Johnson	Case no	TRB-SBB-207925	
Lab sample id	N903058-01_	Client sample id	BOTVXS	
Dept sample id	7705-001	Location/Matrix	100 B/C	SOLID
Received	03/13/99	Collected	03/08/99 10:30	
% solids	88.9	Custody/SAF No	<u>B99-001-100</u> <u>B99-0</u>	01_

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.629	0.26	0.24	0.30		U
Uranium 235	15117-96-1	0.114	0.15	0.29	0.30	Ū	U
Uranium 238	U-238	0.597	0.26	0.24	0.30		Ū
Plutonium 238	13981-16-3	0	0.20	0.44	0.050	U	PU
Plutonium 239/240	PU-239/240	2.18	0.62	0.44	0.050	В	PÜ
Nickel 63	13981-37-8	-0.467	1,4	2.4	20	U	NI_L
Americium 241	14596-10-2	0.417	0.087	0.032	0.050		AM
Total Strontium	SR-RAD	39.3	2.6	1.9	1.0		SR
Potassium 40	13966-00-2	8.24	1.6	10			GAM
Cobalt 60	10198-40-0	U		0.16	0.050	U	GAM
Cesium 134	13967-70-9	U		0.19		U	GAM
Cesium 137	10045-97-3	248	1.6	0.53	0.050		GAM
Europium 152	14683-23-9	Ŭ		2.0	0.10	U	GAM
Europium 154	15585-10-1	U		0.47	0.10	υ	GAM
Europium 155	14391-16-3	U		1.2	0.10	U	GAM
Americium 241	14596-10-2	U		0.56		U	GAM
Uranium 238	U-238	U		17		U	GAM
Uranium 235	15117-96-1	U		2.1		Ü	GAM

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DATA SHEETS

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Lab id TMANC
Protocol Hanford
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N903058-02

DATA SHEET

BOTVX6

SDG	7705	Client/Case no	Hanford	SDG-H0354
Contact	L.A. Johnson	Case no	TRB-SBB-207925	
Lab sample id	N903058-02_	Client sample id	BOTVX6	
Dept sample id		Location/Matrix	100 B/C	SOLID
Received	03/13/99	Collected	03/08/99 10:45	
% solids	91.4	Custody/SAF No	B99-001-100 B9	9-001

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.564	0.27	0.25	0.30		U
Uranium 235	15117-96-1	0.040	0.080	0.31	0.30	U	U
Uranium 238	U-238	0.597	0.27	0.25	0.30		U
Plutonium 238	13981-16-3	-0.079	0.11	0.29	0.050	U	PU
Plutonium 239/240	PU-239/240	0.477	0.22	0.20	0.050	В	PÜ
Nickel 63	13981-37-8	-0.503	1.4	2.4	20	U	NI_L
Americium 241	14596-10-2	0.075	0.050	0.055	0.050		AM
Total Strontium	SR-RAD	5.35	1.8	2.2	1.0		SR
Potassium 40	13966-00-2	9.33	0.60	0.29			GAM
Cobalt 60	10198-40-0	U		0.031	0.050	U	GAM
Cesium 134	13967-70-9	U		0.041		U	GAM
Cesium 137	10045-97-3	11.9	0.15	0.053	0.050		GAM
Europium 152	14683-23-9	0.453	0.094	0.14	0.10		GAM
Europium 154	15585-10-1	U		0.10	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Radium 226	13982-63-3	0.287	0.082	0.092	0.10		GAM
Radium 228	15262-20-1	0.517	0.13	0.13	0.20		GAM
Thorium 228	14274-82-9	0.499	0.050	0.064			GAM
Thorium 232	TH-232	0.517	0.13	0.13			GAM
Americium 241	14596-10-2	u.		0.11		U	GAM
Uranium 238	U-238	Ŭ		3.7		U	GAM
Uranium 235	15117-96-1	U		0.18		Ū	GAM

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DATA SHEETS

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-DS</u>

Version <u>3.06</u>

Report date <u>03/30/99</u>

N903058-03

DATA SHEET

BOTVX8

	7705 L.A. Johnson	Client/Case no Case no	Hanford TRB-SBB-207925	SDG-H0354
Lab sample id Dept sample id Received % solids	7705-003 03/13/99	-		SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.874	0.37	0.27	0.30		U
Uranium 235	15117-96-1	0	0.085	0.32	0.30	U	U
Uranium 238	U-238	0.804	0.36	0.27	0.30		U
Plutonium 238	13981-16-3	0.046	0.093	0.15	0.050	U	PU
Plutonium 239/240	PU-239/240	4.78	0.62	0.15	0.050	В	PU
Nickel 63	13981-37-8	-0.591	1.5	2.5	20	U	NI_I
Americium 241	14596-10-2	0.879	0.13	0.049	0.050		AM
Total Strontium	SR-RAD	79.3	4.8	3.3	1.0		sr
Potassium 40	13966-00-2	134	2.7	3.7			GAM
Cobalt 60	10198-40-0	U		0.18	0.050	U	GAM
Cesium 134	13967-70-9	U		0.21		U	GAM
Cesium 137	10045-97-3	182	1.4	0.49	0.050		GAM
Europium 152	14683-23-9	2.44	1.4	1.6	0.10		GAM
Europium 154	15585-10-1	U		0.52	0.10	U	GAM
Europium 155	14391-16-3	U		1.1	0.10	U	GAM
Radium 228	15262-20-1	1.07	0.60	0.66	0.20		GAM
Thorium 232	TH-232	1.07	0.60	0.66			GAM
Americium 241	14596-10-2	U		0.99		Ü	GAM
Uranium 238	บ-238	U		21		U	GAM
Uranium 235	15117-96-1	ט		1.9		U	GAM

100 BC Areas-Quick Turn

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N903058-04

DATA SHEET

BOTVX9

Į.	7705 L.A. Johnson	Client/Case no Case no	Hanford SDG-HG TRB-SBB-207925	354
}		Client sample id Location/Matrix Collected Custody/SAF No	100 B/C SC 03/08/99	DLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.734	0.29	0.22	0.30		Ū
Uranium 235	15117-96-1	0.034	0.068	0.26	0.30	IJ	Ų
Uranium 238	U-238	0.734	0.29	0.22	0.30		U
Plutonium 238	13981-16-3	0.107	0.11	0.20	0.050	U	PU
Plutonium 239/240	PU-239/240	3.64	0.70	0.20	0.050	B	PU
Nickel 63	13981-37-8	-1.36	1.3	2.2	20	U	NI_L
Americium 241	14596-10-2	0.178	0.062	0.063	0.050		AM
Total Strontium	SR-RAD	15.5	2.3	2.2	1.0		SR
Potassium 40	13966-00-2	7.37	1.6	0.98			GAM
Cobalt 60	10198-40-0	U		0.12	0.050	U	GAM
Cesium 134	13967-70-9	ŭ		0.17		U	GAM
Cesium 137	10045-97-3	25.5	0.50	0.21	0.050		GAM
Europium 152	14683-23-9	1.98	0.55	0.62	0.10		GAM
Europium 154	15585-10-1	Ū		0.37	0.10	ប	GAM
Europium 155	14391-16-3	U		0.45	0.10	Ŭ	GAM
Radium 226	13982-63-3	0,302	0.26	0.32	0.10	U	GAM
Thorium 228	14274-82-9	0.420	0.25	0.30			GAM
Americium 241	14596-10-2	U		0.23		U	GAM
Uranium 238	U-238	U		14		U	GAM
Uranium 235	15117-96-1	U		0.77		ប	GAM

100 BC Areas-Quick Turn

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N903058-05

DATA SHEET

BOTVY0

ļ		7705	Client/Case no		SDG-H0354
	Contact	L.A. Johnson	Case no	TRB-SBB-207925	
1	Lab sample id	N903058-05	Client sample id	BOTVYO	
ł	Dept sample id	7705-005	Location/Matrix	100 B/C	SOLID_
1	Received	03/13/99	Collected	03/09/99 08:20	
	% solids	92.5	Custody/SAF No	<u>B99-001-101</u> <u>B99-0</u>	01_

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.386	0.24	0.23	0.30		Ū
Uranium 235	15117-96-1	0.108	0.14	0.28	0.30	U	U
Uranium 238	U-238	0.386	0.24	0.23	0.30		Ŭ
Plutonium 238	13981-16-3	0	0.084	0.23	0.050	U	PU
Plutonium 239/240	PU-239/240	0.336	0.17	0.16	0.050	В	ΡŪ
Nickel 63	13981-37-8	-0.914	1.7	2.9	20	U	NI_L
Americium 241	14596-10-2	0	0.023	0.054	0.050	U	AM
Total Strontium	SR-RAD	-0.367	1.4	2.0	1.0	U	SR
Cobalt 60	10198-40-0	U		0.098	0.050	U	GAM
Cesium 134	13967-70-9	ប		0.13		U	GAM
Cesium 137	10045-97-3	ប		0.13	0.050	U	GAM
Europium 152	14683-23-9	U		0.32	0.10	U	GAM
Europium 154	15585-10-1	U		0.36	0.10	U	GAM
Europium 155	14391-16-3	U		0.23	0.10	U	GAM
Radium 226	13982-63-3	0.408	0.22	0.21	0.10		GAM
Thorium 228	14274-82-9	0.684	0.17	0.15			GAM
Americium 241	14596-10-2	U		0.13		U	GAM
Uranium 238	U-238	U		12		U	GAM
Uranium 235	15117-96-1	U		0.39		U	GAM

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DATA SHEET

BOTVY1

SDG	7705	Client/Case no	Hanford	SDG-H0354
Contact	L.A. Johnson	Case no	TRB-SBB-207925	
Lab sample id	N903058-06	Client sample id	BOTVY1	
Dept sample id	7705-006	Location/Matrix	100 B/C	SOLID
Received	03/13/99	Collected	03/09/99 08:35	
% solids	87.9	Custody/SAF No	B99-001-101 B9	<u>9-001</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.376	0.21	0.26	0.30		U
Uranium 235	15117-96-1	0.124	0.17	0.32	0.30	U	U
Uranium 238	U-238	0.753	0.35	0.26	0.30		U
Plutonium 238	13981-16-3	-0.136	0.11	0.36	0.050	U	PU
Plutonium 239/240	PU-239/240	0.926	0.33	0.30	0.050	В	PU
Nickel 63	13981-37-8	0.621	1.5	2.4	20	U	NI L
Americium 241	14596-10-2	0.184	0.067	0.045	0.050		AM
Total Strontium	SR-RAD	8.07	1.7	1.9	1.0		SR
Potassium 40	13966-00-2	9.89	1.5	0.91			GAM
Cobalt 60	10198-40-0	U		0.15_	0.050	ប	GAM
Cesium 134	13967-70-9	Ū		0.12		U	GAM
Cesium 137	10045-97-3	36.0	0.61	0.17	0.050		GAM
Europium 152	14683-23-9	0.777	0.39	0.56	0.10		GAM
Europium 154	15585-10-1	ប		0.37	0.10	U	GAM
Europium 155	14391-16-3	Ū		0.31	0.10	U	GAM
Radium 226	13982-63-3	0.522	0.31	0.31	0.10		GAM
Radium 228	15262-20-1	0.631	0.37	0.37	0.20		GAM
Thorium 228	14274-82-9	0,332	0.24	0.31			GAM
Thorium 232	TH-232	0.631	0.37	0.37			GAM
Americium 241	14596-10-2	Ū		0.15		U	GAM
Uranium 238	U-238	U		14		Ū	GAM
Uranium 235	15117-96-1	U		0.94		U	GAM

100 BC Areas-Quick Turn

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SAMPLE DELIVERY GROUP H0354

Test	<u>AM</u>	Matrix	SOLID
SDG	7705		
Contact	L.A.	Johnson	1

METHOD SUMMARY

AMERICIUM 241 IN SOIL ALPHA SPECTROSCOPY Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0354</u>

RESULTS

	LAB	RAW SUF-		Americium
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX PLAN	ICHET	241
Preparation batch 2851-	024		· · · · · · · · · · · · · · · · · · ·	
BOTVX5	N903058-01	7705	5-061	0.417
BOTVX6	N903058-02	7705	5-002	0.075
BOTVX8	N903058-03	7705	S-003	0.879
BOTVX9	N903058-04	7705	-004	0.178
B0TVY0	N903058-05	7705	S-005	U
B0TVY1	N903058-06	7705	- J06	0.184
BLK (QC ID=30327)	N903058-08	7705	i - 008	U
LCS (QC ID=30326)	N903058-07	7705	5-00 7	ok
Duplicate (N903058-01)	N903058-09	7705	- 009	ok
				·
Nominal values and limit	ts from method	RDLs (p	Ci/g)	0.050
100 BC Areas-Quick Turn				

METHOD PERFORMANCE

	L AB	RAW	SUF-	MDA	ALIQ	PREP	DIL U -	AIETD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	g	FAC	TION		뫙	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 2851-	024 2σ pr	ep er	ror 5.	0 % Re	ference	Lab	Noteboo	ok #285	51 pg	, 024						
B0TVX5	N903058-01			0.032	0.500			84		677			15	03/23/99	03/23	SS-006
BOTVX6	N903058-02			0.055	0.500			72		677			15	03/23/99	03/23	\$\$-007
BOTVX8	N903058-03			0.049	0.500			88		677			15	03/23/99	03/23	SS-008
BOTVX9	N903058-04			0,053	0.500			82		677			15	03/23/99	03/23	SS-009
B0TVY0	N903058-05			0.054	0.500			62		677			14	03/23/99	03/23	SS-010
B0TVY1	N903058-06			0.045	0.500			77		677			14	03/23/99	03/23	\$\$-011
BLK (QC ID=30327)	N903058-08			0.019	1.00			91		677				03/23/99	03/23	SS-012
LCS (QC ID=30326)	N903058-07			0.019	1.00			99		677				03/23/99	03/23	SS-005
Duplicate (N903058-01)	N903058-09			0.033	0.500			81		677			15	03/23/99	03/23	\$\$-013
(QC ID=30328)																
Nominal values and limi	ts from metho	od		0.050	1.00			20-105	5	700	100		180			

METHOD SUMMARIES

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Lab id TMANC
Protocol Hanford

Version Ver 1.0

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Version <u>3.06</u>
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SAMPLE DELIVERY GROUP H0354

Test	<u>AM</u>	Matrix	SOLID
SDG	7705		
Contact	L.A.	Johnson	1

METHOD SUMMARY, cont.

AMERICIUM 241 IN SOIL ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0354

PR	OCEDURES	REFERENCE	AM/CMPLATE
		EP-060	Soil Preparation, rev 0
		EP-070	Soil Dissolution, rev 0
		EP-940	Plutonium Purification, rev 0
		EP-960	Americium-Curium Purification, rev 0
		EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD MDA 0.041 ± 0.032
FOR 9 SAMPLES YIELD 82 ± 22

METHOD SUMMARIES

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Form <u>DVD-CMS</u>

Version <u>3.06</u>

Report date <u>03/30/99</u>

Lab id <u>TMANC</u>

SAMPLE DELIVERY GROUP H0354

Test <u>PU</u> Matrix <u>SOLID</u>

SDG <u>7705</u>

Contact <u>L.A. Johnson</u>

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>

Case no SDG-H0354

RESULTS

	LAB	RAW SUF-	Plutonium	Plutonium	
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX PLANCHE	T 238	239/240	
Preparation batch 2851-	024				
BOTVX5	N903058-01	7705-00	1 U	2.18	
B0TVX6	N903058-02	7705-00	2 U	0.477	
BOTVX8	N903058-03	7705-00	3 · U	4.78	
BOTVX9	N903058-04	7705-00	4 0.107 U	3.64	
BOTVY0	N903058-05	7705-00	5 U	0.336	
BOTVY1	N903058-06	7705-00	6 U	0.926	
BLK (QC ID=30327)	N903058-08	7705-00	8 0.732	<u>0.765</u>	
LCS (QC ID=30326)	N903058-07	7705-00	7 ok	ok	
Duplicate (N903058-01)	N903058-09	7705-00	9 - U	⊃k	

METHOD PERFORMANCE

	LAB	RAW	SUF-	Max Mda	ALIQ	PREP	DILU-	AIEID	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	a	FAC	TION	ક	*	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 2851-	024 2σ pr	ep er	ror 5.	0% Ref	erence	Lab	Noteboo	sk #285	1 pg	. 024						
BOTVX5	N903058-01			0.44	0.100			52		698			11	03/18/99	03/19	SS-064
BOTVX6	N903058-02			0.29	0.100			62		698			11	03/18/99	03/19	SS-066
B0TVX8	N903058-03			0.15	0.100			61		1256			13	03/18/99	03/21	SS-006
BOTVX9	N903058-04			0,20	0.100			57		776			12	03/18/99	03/20	SS-006
BOTVY0	N903058-05			0.23	0.100			75		776			11	03/18/99	03/20	SS-007
B0TVY1	N903058-06			0.36	0.100			56		776			11	03/18/99	03/20	SS-008
BLK (QC ID=30327)	N903058-08			0.028	1.00			61		774				03/18/99	03/20	SS-010
LCS (QC ID=30326)	N903058-07			0.052	1.00			46		776				03/18/99	03/20	SS-009
Duplicate (N903058-01) (QC ID=30328)	N903058-09			0.31	0.100			50		774			12	03/18/99	03/20	SS-011
Nominal values and limit	ts from metho	d		0.050	1.00			20-105		10	100		180			

METHOD SUMMARIES

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Report date 03/30/99

SAMPLE DELIVERY GROUP H0354

Test	PU	Matrix	SOLID
SDG	7705		
Contact	<u>L.A.</u>	Johnson	1

METHOD SUMMARY, cont.

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0354

	<u> </u>	
PROCEDURES	REFERENCE	PUPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES t 2 SD MDA 0.23 t 0.27

FOR 9 SAMPLES YIELD 58 t 17

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SAMPLE DELIVERY GROUP H0354

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client <u>Hanford</u>

Contract TRB-SBB-207925

Case no <u>SDG-H0354</u>

RESULTS

SDG <u>7705</u>

Contact L.A. Johnson

Test U Matrix SOLID

	LAB	RAW SUF-		1: Uranium	2: Uranium	3: Uranium	RESU	LT RA	TIOS	(%)
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX	PLANCHET	233/234	235	238	1÷3	2σ	2÷3	2σ
Preparation batch 2851-	024					. <u>-</u>			_	
BOTVX5	N903058-01		7705-001	0.629	U	0.597	105	63	19	26
B0TVX6	N903058-02		7705-002	0.564	U	0.597	94	62	7	14
B0TVX8	N903058-03		7705-003	0.874	Ü	0.804	109	67	0	11
BOTVX9	N903058-04		7705-004	0.734	U	0.734	100	56	5	9
BOTVYO	N903058-05		7705-005	0.386	U	0.386	100	88	28	40
B0TVY1	N903058-06		7705-006	0.376	U	0.753	<u>50</u>	36	16	24
BLK (QC ID=30327)	N903058-08		7705-008	U	U	n				
LCS (QC ID=30326)	N903058-07		7705-007	ok	ok	ok				
Duplicate (N903058-01)	N903058-09		7705-009	ok	- a	ok	83	52	11	12
Nominal values and limit	ts from metho	d RD	Ls (pCi/g)	0.30	0.30	0.30	100		4	
100 BC Areas-Quick Turn							Averages 92		12	

METHOD PERFORMANCE

	I.AB	RAW	SUF-	MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	g	FAC	TION	탕	*	min	keV_	KeV	HELLD	PREPARED	YZED	DETECTOR
Preparation batch 2851-	024 2σ pr	ep er	ror 5.	0 % Rei	ference	Lab	Noteboo	ok #285	1 pg	j. 024				***		
BOTVX5	N903058-01			0.29	0.500			72		102			12	03/19/99	03/20	SS-005
B0TVX6	N903058-02			0.31	0.500			67		102			12	03/19/99	03/20	SS-006
B0TVX8	N903058-03			0.32	0.500			67		102			12	03/19/99	03/20	SS-007
B0TVX9	N903058-04			0.26	0.500			84		102			12	03/19/99	03/20	SS-009
B0TVY0	N903058-05			0.28	0.500			79		102			11	03/19/99	03/20	SS-011
B0TVY1	N903058-06			0.32	0.500			68		102			11	03/19/99	03/20	SS-012
BLK (QC ID=30327)	N903058-08			0.16	1.00			66		102				03/19/99	03/20	SS-015
LCS (QC ID=30326)	N903058-07			0.35	1.00			77		116				03/19/99	03/20	SS-055
Duplicate (N903058-01)	N903058-09			0.33	0,500			65		102			12	03/19/99	03/20	SS-016
(QC ID=30328)																
Nominal values and limit	ts from metho	d		0.30	1.00			30-105		150	100		180	***		

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SAMPLE DELIVERY GROUP H0354

Test	<u>U</u>	Matrix	SOLID
SDG	7705		
Contact	L.A.	Johnsor	1

METHOD SUMMARY, cont.

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0354</u>

	'		
	PROCEDURES	REFERENCE	UPLATE
		EP-060	Soil Preparation, rev 0
		EP-070	Soil Dissolution, rev 0
ı		EP-910	Uranium Purification, rev 0
		EP-008	Heavy Elements Electroplating, rev 0
١			

 AVERAGES ± 2 SD
 MDA
 0.29
 ±
 0.11

 FOR 9 SAMPLES
 YIELD
 72
 ±
 14

METHOD SUMMARIES

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SAMPLE DELIVERY GROUP H0354

Test	SR	Matrix	SOLID
SDG	<u>7705</u>		
Contact	L.A.	Johnson	1

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0354

RESULTS

CLIENT SAMPLE ID		RAN SUF- TEST FIX PLANCHET	Total Strontium			
Preparation batch 2851-	024					
BOTVX5	N903058-01	7705-001	39.3			
BOTVX6	N903058-02	7705-002	5,35	•		
BOTVX8	N903058-03	7705-003	79.3			
BOTVX9	N903058-04	7705-004	15.5			
BOTVY0	N903058-05	7705-005	Ū			
BOTVY1	N903058-06	7705-006	8.07			
BLK (QC ID=30327)	N903058-08	7705-008	Ū			
LCS (QC ID=30326)	N903058-07	7705-007	ok			
Duplicate (N903058-01)	N903058-09	7705-009	ok			
Nominal values and limi		RDLs (pCi/g)	1.0		 	

METHOD PERFORMANCE

	LAB	RAW	SUF-	MAX I	MDA ALI	PREP	DILU-	AIETD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/	g g	FAC	TION	ş	용	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 2851-)24 2σ pr	ep er	ror 10	.0 %	Referen	e Lab	Not ebo	ok #28:	51 p	y. 024						
BOTVX5	N903058-01			1.9	0.10	<u>)</u>		90		400			11	03/18/99	03/19	GRB-217
B0TVX6	N903058-02			2.2	0.10	<u>2</u>		75		400			11	03/18/99	03/19	GRB-218
B0TVX8	N903058-03			3.3	0.10	<u>)</u>		49		400			11	03/18/99	03/19	GRB-219
BOTVX9	N903058-04			2.2	0.10	<u>)</u>		77		400			11	03/18/99	03/19	GRB-221
BOTVYO	N903058-05			2.0	0.10	<u>)</u>		82		400			10	03/18/99	03/19	GRB-222
BOTVY1	N903058-06			1.9	0.10	<u>)</u>		93		400			10	03/18/99	03/19	GRB-223
BLK (QC ID=30327)	N903058-08			0.60	1.00)		34		148				03/18/99	03/19	GRB-231
LCS (QC ID=30326)	N903058-07			0.26	5 1.0			91		107				03/18/99	03/19	GRB-217
Duplicate (N903058-01)	N903058-09			2.0	0.100	<u>)</u>		85		150			11	03/18/99	03/19	GRB-232
(QC ID=30328)																
Nominal values and limit	s from metho	d		1.0	1.00)				100			180			

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.3</u>

Form DVD-GMS
Version 3.06

Report date 03/30/99

SAMPLE DELIVERY GROUP H0354

Test	SR_	Matrix <u>SOLID</u>
SDG	7705	
Contact	<u>L.A.</u>	Johnson

METHOD SUMMARY, cont.

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client	<u>Hanford</u>
Contract	TRB-SBB-207925
Case no	SDG-H0354

PROCEDURES RP-500 Strontium - Initial Separation, rev 0

RP-519 Strontium-89,90 Demounting and Yttrium

Purification, rev 0

AVERAGES ± 2 SD MDA 1.8 ± 1.8

FOR 9 SAMPLES YIELD 75 ± 41

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Protocol <u>Hanford</u>

Version <u>Ver 1.3</u>

Form <u>DVD-CMS</u>

Version <u>3.06</u>

Report date <u>03/30/99</u>

Lab id TMANC

SAMPLE DELIVERY GROUP H0354

Test <u>GAM Matrix SOLID</u>

SDG <u>7705</u>

Contact <u>L.A. Johnson</u>

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client <u>Hanford</u>

Contract TRB-SBB-207925

Case no SDG-H0354

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	Cobalt 60	Cesium 137	
Preparation batch 2851-	024			<u></u>		
BOTVX5	N903058-01		7705-001	U	248	
BOTVX6	N903058-02		7705-002	Ü	11.9	
BOTVX8	N903058-03		7705-003	. n	182	
BOTVX9	N903058-04		7705-004	U	25.5	
BOTVY0	N903058-05		7705-005	U	U	
BOTVY1	N903058-06		7705-006	Ū	36.0	
BLK (QC ID=30327)	N903058-08		7705-008	U	υ	
LCS (QC ID=30326)	N903058-07		7705-007	ok	ok	
Duplicate (N903058-01)	N903058-09		7705-009	ok	ok	

METHOD PERFORMANCE

	LAB	RAW	SUF-	MAX MI	DA ALI	PREP	DILU-	AIETD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL~	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	g	FAC	TION	*	ક	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 2851-	024 2 <i>a</i> pr	ep er	ror 19	5.0 % F	Referenc	e Lab	Notebo	ok #28!	51 pg	g. 024						
BOTVX5	N903058-01			0.53	159	-				101			10	03/13/99	03/18	JR,07,00
BOTVX6	N903058-02			0.053	166	_				436			10	03/13/99	03/18	JR,04,00
BOTVX8	N903058-03			0.49	149	_				103			10	03/13/99	03/18	JR,07,00
BOTVX9	N903058-04			0.21	182					102			10	03/13/99	03/18	JR,07,00
BOTVYO	N903058-05			0,13	183					101			9	03/13/99	03/18	JR,07,00
B0TVY1	N903058-06			0.17	159					185			10	03/13/99	03/19	JR,01,00
BLK (QC ID=30327)	N903058-08			0.018	750					142				03/13/99	03/19	JR, 97, 00
LCS (QC ID=30326)	N903058-07			0.022	750					185				03/13/99	03/19	JR,03,00
Duplicate (N903058-01)	N903058-09			0.25	158	_				184			11	03/13/99	03/19	JR,04,00
(QC ID=30328)																_
Nominal values and limit	s from metho	d		0.050	750					100			180			

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.3</u>

Form <u>DVD-CMS</u>

Version <u>3.06</u>
Report date <u>03/30/99</u>

SAMPLE DELIVERY GROUP H0354

Test	GAM	Matrix	SOLID
SDG	7705		
Contact	I. A.	Johnson	,

METHOD SUMMARY, cont.

GAMMA SCAN
GAMMA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0354

	PROCEDURES	REFERENCE	GAMMAHI
	ı	EP-060	Soil Preparation, rev 0
		EP-100	Ge(Li) Preparation for Environmental Samples,
Ì			rev 0
			l l

METHOD SUMMARIES

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 Lab 1d
 TMANC

 Protocol
 Hanford

 Version
 Ver 1.0

 Form
 DVD-CMS

 Version
 3.06

 Report date
 03/30/99

SAMPLE DELIVERY GROUP H0354

Test NI L Matrix SOLID SDG 7705 Contact L.A. Johnson

METHOD SUMMARY

NICKEL 63 IN SOIL LIQUID SCINTILLATION COUNTING

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0354</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	Nicke	1 63	
Preparation batch 2851-	024	·				
B0TVX5	N903058-01		7705-001	U		
BOTVX6	N903058-02		7705-002	U		
BOTVX8	N903058-03		7705-003	. α		
BOTVX9	N903058-04		7705-004	U		
B0TVY0	N903058-05		7705-005	ū		
BOTVY1	N903058-06		7705-006	U		
BLK (QC ID=30327)	N903058-08		7705-008	U		
LCS (QC ID=30326)	N903058-07		7705-007	ok		
Duplicate (N903058-01)	N903058-09		7705-009	-	U	

METHOD PERFORMANCE

	L AB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	AIETD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	a a	FAC	TION	ક	\$	min	keV	KeV	HELLD	PREPARED	YZED	DETECTOR
Preparation batch 2851-	024 2σ pr	ep er	ror 10).0 %	Reference	Lab	Noteboo	ok #285	51 pg	j. 024						
BOTVX5	N903058-01			2.4	0.500					100			17	03/19/99	03/25	LSC-005
BOTVX6	N903058-02			2.4	0.500					100			17	03/19/99	03/25	LSC-005
BOTVX8	N903058-03			2.5	0.500					100			17	03/19/99	03/25	LSC-005
BOTVX9	N903058-04			2.2	0.500					100			17	03/19/99	03/25	LSC-005
BOTVYO	N903058-05			2.9	0.500					100			16	03/19/99	03/25	LSC-005
BOTVY1	N903058-06			2.4	0.500					100			16	03/19/99	03/25	LSC-005
BLK (QC ID=30327)	N903058-08			2.0	0.500					100				03/19/99	03/25	LSC-005
LCS (QC ID=30326)	N903058-07			2.0	0.500					100				03/19/99	03/25	LSC-005
Duplicate (N903058-01)	N903058-09			2.4	0.500					100			17	03/19/99	03/25	LSC-005
(QC ID=30328)																
			-												· · · · · · · · · · · · · · · · · · ·	
Nominal values and limi	ts from metho	d		20	0.500					10			180			

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford

Version <u>Ver 1.0</u>

Form DVD-CMS

Version 3.06

Report date <u>03/30/99</u>

SAMPLE DELIVERY GROUP H0354

Test	NI L	Matrix	SOLID
SDG	7705		
Contact	L.A.	Johnson	1

METHOD SUMMARY, cont.

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0354

PROCEDURES REFERENCE NI63LSC

EP-060 Soil Preparation, rev 0

EP-431 Nickel-63 Purification, rev 0

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CMS

Version 3.06

Report date 03/30/99

SDG 7705
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0354

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.
 - QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.
- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

REPORT GUIDES

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Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 03/30/99

SAMPLE DELIVERY GROUP H0354

SDG <u>7705</u> Contact L.A. Johnson

REPORT GUIDE

Client Hanford Contract TRB-SBB-207925

Case no SDG-H0354

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

Lab id TMANC

Protocol Hanford

Version <u>Ver 1.0</u>

Form DVD-RG

Version 3.06

Report date <u>03/30/99</u>

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SDG 7705
Contact L.A. Johnson

REPORT GUIDE

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0354</u>

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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SUMMARY DATA SECTION

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-RG</u>

Version <u>3.06</u>

Report date <u>03/30/99</u>

SDG 7705
Contact L.A. Johnson

REPORT GUIDE

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0354

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 03/30/99

SDG 7705
Contact L.A. Johnson

GUIDE, cont.

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0354</u>

DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H0354 SDG 7705 Contact L.A. Johnson

GUIDE, cont.

Client <u>Hanford</u> Contract TRB-SBB-207925 Case no SDG-H0354

DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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Lab id TMANC Protocol Hanford Version Ver 1.0 Form DVD-RG Version 3.06 Report date 03/30/99

SDG 7705
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0354

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 - 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

- 2. The error of ADDED.
- A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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SUMMARY DATA SECTION

Version <u>3.06</u>
Report date <u>03/30/99</u>

Lab id TMANC
Protocol Hanford
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Form DVD-RG

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Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0354

DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:
 - 1. A fixed percentage specified in the protocol.

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Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 03/30/99

SAMPLE DELIVERY GROUP H0354

SDG 7705
Contact L.A. Johnson

GUIDE, cont.

Client		Hanford
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Case	no	SDG-H0354

DUPLICATE

- 2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.
- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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 Lab id
 TMANC

 Protocol
 Hanford

 Version
 Ver 1.0

 Form
 DVD-RG

 Version
 3.06

 Report date
 03/30/99

SDG	7705
Contact	L.A. Johnson

REPORT GUIDE

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0354

MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.
 - If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.
- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.
 - An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.
- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 - 1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.
 - If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 - 2. The error of ADDED.
 - 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-RG</u>

Version <u>3.06</u>

Report date <u>03/30/99</u>

SDG 7705
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0354

MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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SUMMARY DATA SECTION
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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 03/30/99

SDG 7705
Contact L.A. Johnson

REPORT GUIDE

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0354</u>

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

REPORT GUIDES
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SUMMARY DATA SECTION
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Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 03/30/99

SDG 7705
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0354

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Prepareation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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SDG 7705
Contact L.A. Johnson

GUIDE, cont.

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0354</u>

METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06

Report date <u>03/30/99</u>

SDG 7705
Contact L.A. Johnson

GUIDE, cont.

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0354</u>

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-RG</u>

Version <u>3.06</u>

Report date <u>03/30/99</u>

Bechtel Hanford Inc.			TODY/SAMPLE ANALYSIS				REQUEST		· B99 ·	-001-100	Page of		
Collector Tolking Collector To	Compa R Co	any Contact offman	Telephone No. 4 373-6425				Project Coordinat TRENT, SJ	or	Price Code	, .	Date Tur	naround	
Project Designation 1 100 BC Areas - Quick Turn	Sampli 100	ing Location B/C					SAF No. 399-001				7 🖸	1373	
Shipping van 96-002		Logbook No. 1327-2					Method of Shipme	ent					
Shipped To 3.8.99	Offsite	Property No.	0080			ľ	Bill of Lading/Air		57952	3302			
							COA - RI	166	3H 2602	BII)PA	RILE	11260	
POSSIBLE SAMPLE HAZARDS/REMARKS		Preservation	None	Cool 4C	Cool 4C	Cool 40	None						
		Type of Container	P	ati	a(J	āÚ	aG					Action	
Special Handling and/or Storage		No. of Container(s) Volume	20mL	1 60mL	i 60mL	l 60mL	500mL				4 1 1 1 1 1 1 1		
SAMPLE ANALYSIS			Activity Scan	See Ham (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 826 (TCL)		•		ţ	,		
	iple Date	Samue Time	W. V. L.	44/4	ANEXIE	373				第三			
BOTVX5 Soil 3.	8-99	1030	X		<u> </u>		×		<u> </u>	tie -	. BO	TVIT	
BOTVX6 Soil 3.1	2-15	645	X		<u> </u>	<u> </u>	<u>*</u>			+10+	- Bo	118	
BOTVXT & NIELIGE Soil 3	8 71	1100	X				X			+12+	150	TV 19	
BOTVX8 Soil 3.	8 . 9	9 0940	<u> </u>	<u> </u>	<u> </u>	<u> </u>				1111	Ro	TVIG	
			<u> </u>	<u> </u>		<u> </u>				<u> </u>	<u> </u>		
CHAIL OF POSSESSION	Sign/Pri	int Names			CAL INSTR		NS -846) (Chromium, Le		7431 (0		Matrix Soil	. •	
Relinquished By Relinquished By Date/Time Rece Relinquished By Date/Time Rece	ived By	so TA Cove	Date/Time 7-12-99 Date/Time 6/ 3-13-9	Chro (2) (Gam Isoto	mium Hex - 71 Samma Spectro ma Spec - Add	196 oscopy (C I-on (Ame	esium-137, Cobalt-60 ricium-241, Cesium- Jranium; Strontium-8	, Europi 134, Ura	ium-154, Europiu inium-238); Amer	m-155); rjejum-241;	Water Vapor Other Solid Other Liqui		
	ived By		Date/Time						•		· ·	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Relinquished By LABORATORY Received By SECTION		X 1971		itie		<u>,</u>	<u> </u>		· · · · · · · · · · · · · · · · · · ·		Date/Time		
FINAL SAMPLE Disposal Method DISPOSITION	· · · · · · · · · · · · · · · · · · ·		A		Disp	osed By	:				Date/Time		

Bechtel Hanford	Inc.	c	HAIN OF CUST	REQUES	T	B99-001-101		Page <u>1</u>	of <u>l</u>							
Collector Fahlberg/Kerkow			pany Contact Coffman	Telepho 373-6				Project Coord	linator	Price Code	wa	Data Tur	naround			
Project Designation 100 BC Areas - Quick Turn			ling Location B/C 116-13-7	Z				SAF No. B99-001								
Ice Chest No.		l FI.	Logbook No.	Method of Sh	pment	iv		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								
Shipped To TMA/RECRA- C. F 3 · 9 ·	39	Offsic								Bill of Lading/Air Bill No. 79523301 COA RIGBILZION						
·	·							COA	R16	B11261	N					
POSSIBLE SAMPLE HAZAI	RDS/REMARKS		Preservation	None	Cool 4C	Cool 4C	Cool 40									
			Type of Container	P	aG	aG	aG	aG								
Special Handling and/or Store	ge		No. of Container(s) Volume	1 20mL	1 60mL	l 60mL	60mL	. 500mL					1			
	SAMPLE ANA	LYSIS		Activity Scan	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 82((TCL)		l l							
Sample No.	Matrix *	Sample Date	Sample Time		CERTAIN THE								24			
BOTVX8	Seil-	F83.8.8	9				County woods (1984)		And the second of the second o	A STATE OF THE STA	al acress, a reach	A ere Fire a Sylbor 2				
BOTVX9	Soil	3.9.99	0820	X	·		<u> </u>	×				tieto	BOTV3			
BOTVY0	. Soil	3.9.9		X				X					BOTVI			
BOTVYI	50i (3-9.9	9 0835	X			ļ	X_				tieto	BOTV 33			
CHAIN OF POSSESSION	. 5	Sign/Pri	int Names	<u> </u>		IAL INSTR			1 0	ercury - 7471 - (C		Matrix Soil	•			
Relinquished By	Pate/Time 3/19	Received By	es es .	ate/Time 9 - 1 3 - 99	Chro	mium Hex - 71 Famma Spectro ma Spec - Add	196 oscopy (Co I-on (Ame	esium-137, Coba ricium-241, Cesi	lt-60, Europ 1m-134, Ur	oium-154, Europiu anium-238}; Ame	m-155}; ricium-241;	Water Vapor Other Solid Other Liquid	1			
ا شا	-13-99 //:	Received By	10 J RCD V50	3-18- Pate/Time	99	pic Plutonium;	, isotopic (Jranium; Strontiu	m-89,90	Total Sr; Nickel-6						
Relinquished By	Date/Time	Received By	D	ate/Time												
LABORATORY Received By SECTION				ī	itle						ſ	Pate/Time	,			
FINAL SAMPLE Disposal Mo	ethod					Disp	osed By					Date/Time				

DISPOSITION

SAMPLE RECEIPT CHECKLIST

	SAMPLE RECEIPT									
Client: Bechtel Hanford Date/Time received 3-13-99 11:50										
Coc No. <u>B99-001-100</u> , <u>B99-001-101</u> Shipping Care										
Container I.D. No. 96 - DOZ Requested TAT (Days) 7 P.O. Received Yes [] No [2]										
	INSPECTION									
1.	Custody seals on shipping container intact? Yes [No [] N/A []									
2.	Custody seals on shipping container dated & signed? Yes (No [] N/A []									
3.	Custody seals on sample containers intact? Yes [No [] N/A []									
4.	Custody seals on sample containers dated & signed? Yes [No [] N/A []									
5.	Cooler Temperature: Packing material is: Wet [] Dry []									
6.	Number of samples in shipping container:									
7.	Number of containers per sample: (Or see CoC)									
8.	Paperwork agrees with samples? Yes [No []									
9.	Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels []									
10.	Samples are: In good condition [] Leaking [] Broken Container [] Missing []									
11.	Describe any anomalies:									
13.	Was P.M. notified of any anomalies? Yes [] No [] Date									
14.	Received by McCorat Date: 3-13-99 Time: 11:00									
	LOGIN									
TNU W	7.O. No. Group No. Client W.O. No.									
	PROGRAM MANAGER									
Sample	e holding times exceeded? Yes [] No []									
Client	Notified: Name Date/time									

Contractor

BHI - Hanford

OFF-SITE PROPERTY CONTROL

	CONTROL NO.
(To be a	Designed from PROPERTY MANAGEMENT)
	F+(1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2,

	PART I - TO I	E COMPLETED BY ORIGIN	ATOR	
Department ERC Eng	ineering Support Section Fig	eld & Analytical :	Support ^{Unit} Field Samplin	g
The follow	ing items are to be shipped from	Contractor	Vendor	
Routing		X Prepaid	Collect	
Company 2030 k Address Richmo City (510)2	Nutech right Ave nd, CA 94804-0040 35-2633 State Zip Code Johnson	Off-site Custodian On-site Custodian		Payroll No.
Qty. Property No.	Description (inclu	de Manufacture Name, Mo	ndel. Serial No.)	Acquisition Cost
1	Sample #: BOTYX5, BOT Cooler ID: Shipping Val Polycooler with environment BILL OF LADING # 423	VY6, BUTVX8, 1 96.002 ental samples pac	BOTV K9, BOTVYO, BO ked in packing peanuts	· · · · · · · · · · · · · · · · · · ·
1 lbs. XXXX	Sample #: Cooler ID: Polycooler with environme BILL OF LADING #	ental samples pac	ked in packing peanuts.	N/A
Classified	X Unclassified Shipped Under	DOE Contract	Shipped Under Contractor's Use Per	nit Contract
Business Trip Off-site Assig Shipment to S Other (Please	subcontractor. List Subcontract No			
CERTIFICATION OF T	HE RADIATION MONITORING RELEASE N	NUST BE SECURED THE SA	AME DAY THAT MATERIAL IS DELIVE	RED TO SHIPPING.
RM Clearance for Public	Release	RM Survey No.		Date
	t for Property (Name/Phone No./Bldg./Are (509)372-9604/3728 Bldg/3	00 Area e tombe Charged P.) N	Approximate Date This Property will be Returned	1
Originated By Property Replesentative	linour 3/6	Authorized By Property Manager	Mills meat Approval Muslenger	Date 3/12/99
Authorized Chanier Ci		OVBE COMPLETED BY SHIP	PPING	
Authorized Shapping Si	elin			3-12-79

DISTRIBUTION (AFTER FINAL SIGNATURES)

SAMPLE DELIVERY GROUP H0354

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0354</u>

RESULTS

Test AM Matrix SOLID

SDG <u>7705</u>

Contact L.A. Johnson

	LAB	RAW SUF-	Americium		
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX PLANCHET	241		
Preparation batch 2851-0	124				
BOTVXS	N903058-01	7705-001	0.417		
BOTVX6	N903058-02	7705-002	0.075	•	
BOTVX8	N903058-03	7705-003	0.879		
BOTVX9	N903058-04	7705-004	0.178		
BOTVYO	N903058-05	7705-005	U		
B0TVY1	N903058-06	7705-006	0.184		
BLK (QC ID=30327)	N903058-08	7705-008	Ü		
LCS (QC ID=30326)	N903058-07	7705-007	ok		
Duplicate (N903058-01)	N903058-09	7705-009	ok		

METHOD PERFORMANCE

	LAB	RAW	SUF-	MDA	ALIQ	PREP	DI LU -	AIEID	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	g	FAC	TION	४	8	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 2851-0	024 2σ pr	ep er	ror 5.	.0 % Re	eference	Lab	Noteboo	ok #285	1 pg	j. 02 4						
B0TVX5	N903058-01			0.032	0.500			84		677			15	03/23/99	03/23	SS-006
B0TVX6	N903058-02			0.055	0.500			72		677			15	03/23/99	03/23	SS-007
BOTVX8	N903058-03			0.049	0.500			88		677			15	03/23/99	03/23	S\$-008
BOTVX9	N903058-04			0.063	0.500			82		677			15	03/23/99	03/23	SS-009
BOTVYO	N903058-05			0.054	0.500			62		677			14	03/23/99	03/23	SS-010
BOTVY1	N903058-06			0.045	0.500			77		677			14	03/23/99	03/23	SS-011
BLK (QC ID=30327)	N903058-08			0.019	1.00			91		677				03/23/99	03/23	SS-012
LCS (QC ID=30326)	N903058-07			0.019	1.00			99		677				03/23/99	03/23	SS-005
Duplicate (N903058-01)	N903058-09			0.033	0.500			81		677			15	03/23/99	03/23	S\$-013
(QC ID=30328)																
Nominal values and limit	s from metho	d		0.050	1.00			20~105		700	100		180			

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H0354

Test	<u>AM</u>	Matrix	SOLID
SDG	7705		
Contact	L.A.	Johnson	1

METHOD SUMMARY, cont.

AMERICIUM 241 IN SOIL ALPHA SPECTROSCOPY Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0354</u>

PROCEDURES	REFERENCE	AM/CMPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-960	Americium-Curium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

 AVERAGES ± 2 SD
 MDA
 0.041
 ±
 0.032

 FOR 9 SAMPLES
 YIELD
 82
 ±
 22

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

Page 19

SAMPLE DELIVERY GROUP H0354

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>

Case no SDG-H0354

RESULTS

Test PU Matrix SOLID

SDG 7705

Contact L.A. Johnson

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX P	LANCHET	Plutonium 238	Plutonium 239/240	
	· · · · · · · · · · · · · · · · · · ·					
Preparation batch 2851-	024					
BOTVX5	N903058-01	7	705-001	ŭ	2.18	
BOTVX6	N903058-02	7	705-002	σ	0.477	
B0TVX8	N903058-03	7'	705-003	, ū	4.78	
BOTVX9	N903058-04	7	705-004	0.107 U	3.64	
BOTVYO	N903058-05	7.	705-005	U	0.336	
B0TVY1	N903058-06	7	705-006	U	0.926	
BLK (QC ID=30327)	N903058-08	7	705-008	0.732	0.765	
LCS (QC ID=30326)	N903058-07	7	705-007	ok	ok	
Duplicate (N903058-01)	N903058-09	7	705-009	- U	ok	

Nominal values and limit	ts from method	i RDLs	(pCi/g)	0.050	0.050	
100 BC Areas-Quick Turn						

METHOD PERFORMANCE

	LAB	RAW	SUF-	MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	g	FAC	TION	ş. 	¥	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 2851-0)24 2σ pr	ep er	ror 5.	0 % Rei	ference	Lab	Noteboo	ok #285	51 pc	j. 024						
B0TVX5	N903058-01			0.44	0.100			52		698			11	03/18/99	03/19	SS-064
B0TVX6	N903058-02			0.29	0.100			62		698			11	03/18/99	03/19	SS-066
BOTVX8	N903058-03			0.15	0.100			61		1256			13	03/18/99	03/21	SS-006
BOTVX9	N903058-04			0.20	0.100			57		776			12	03/18/99	03/20	SS-006
B0TVY0	N903058-05			0.23	0.100			75		776			11	03/18/99	03/20	SS-007
BOTVY1	N903058-06			0.36	0.100			56		776			11	03/18/99	03/20	SS-008
BLK (QC ID=30327)	N903058-08			0.028	1.00			61		774				03/18/99	03/20	SS-010
LCS (QC ID=30326)	N903058-07			0.052	1.00			46		776				03/18/99	03/20	SS-009
Duplicate (N903058-01)	N903058-09			0.31	0.100			50		774			12	03/18/99	03/20	SS-011
(QC ID=30328)																
	·	_														·
Nominal values and limit	s from metho	d		0.050	1.00			20-105	5	10	100		180			

METHOD SUMMARIES

Page 3

SUMMARY DATA SECTION

Page 20

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS

Version 3.06

SAMPLE DELIVERY GROUP H0354

Test	PU	Matrix	SOLID
SDG	7705		
Contact	Ļ.А.	Johnson	1

METHOD SUMMARY, cont.

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0354

PROCE	DURES	REFERENCE	PUPLATE
		EP-060	Soil Preparation, rev 0
ĺ		EP-070	Soil Dissolution, rev 0
ļ		EP-940	Plutonium Purification, rev 0
-		EP-008	Heavy Elements Electroplating, rev 0
L			

AVERAGES ± 2 SD MDA 0.23 ± 0.27
FOR 9 SAMPLES YIELD 58 ± 17

METHOD SUMMARIES

Page 4

SUMMARY DATA SECTION

Page 21

SAMPLE DELIVERY GROUP H0354

Test <u>U</u> Matrix <u>SOLID</u>

SDG <u>7705</u>

Contact <u>L.A. Johnson</u>

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client <u>Hanford</u>

Contract TRB-SBB-207925
Case no SDG-H0354

RESULTS

LAB R	AW SUF-	1: Uranium	2: Uranium	3: Uranium	RESU	LT RA	ATIOS	(%)
SAMPLE ID T	EST FIX PLANCHET	233/234	235	238	1÷3	2σ	$2 \div 3$	2σ
024								
N903058-01	7705-001	0.629	U	0.597	105	63	19	26
N903058-02	7705-002	0.564	U	0.597	94	62	7	14
N903058-03	7705-003	0.874	ū	0.804	109	67	0	11
N903058-04	7705-004	0.734	Ü	0.734	100	56	5	9
N903058-05	7705-005	0.386	Ū	0.386	100.	88	28	40
N903058-06	7705-006	0.376	U	0.753	_50.	36	16	24
N903058-08	7705-008	ū	U	U				
N903058-07	7705-007	ok	ok	ok				
N903058-09	7705-00 9	ok	- U	ok	83	52	11	12
ts from method	RDLs (pCi/g)	0.30	0.30	0.30	100		4	
					Averages 92		12	
	SAMPLE ID T 024 N903058-01 N903058-02 N903058-03 N903058-04 N903058-05 N903058-06 N903058-06	SAMPLE ID TEST FIX PLANCHET 024 N903058-01 7705-001 N903058-02 7705-002 N903058-03 7705-003 N903058-04 7705-004 N903058-05 7705-005 N903058-06 7705-006 N903058-08 7705-008 N903058-09 7705-009 ts from method RDLs (pCi/g)	SAMPLE ID TEST FIX PLANCHET 233/234 024 N903058-01 7705-001 0.629 N903058-02 7705-002 0.564 N903058-03 7705-003 0.874 N903058-04 7705-004 0.734 N903058-05 7705-005 0.386 N903058-06 7705-006 0.376 N903058-08 7705-008 U N903058-07 7705-007 ok N903058-09 7705-009 ok tts from method RDLs (pCi/g) 0.30	SAMPLE ID TEST FIX PLANCHET 233/234 235 024 N903058-01 7705-001 0.629 U N903058-02 7705-002 0.564 U N903058-03 7705-003 0.874 U N903058-04 7705-004 0.734 U N903058-05 7705-005 0.386 U N903058-06 7705-006 0.376 U N903058-08 7705-008 U U N903058-09 7705-007 ok ok N903058-09 7705-009 ok - U	SAMPLE ID TEST FIX PLANCHET 233/234 235 238 024 N903058-01 7705-001 0.629 U 0.597 N903058-02 7705-002 0.564 U 0.597 N903058-03 7705-003 0.874 U 0.604 N903058-04 7705-004 0.734 U 0.734 N903058-05 7705-005 0.386 U 0.386 N903058-06 7705-006 0.376 U 0.753 N903058-08 7705-008 U U U N903058-09 7705-007 ok ok ok N903058-09 7705-009 ok - U ok	SAMPLE ID TEST FIX PLANCHET 233/234 235 238 1+3 024 N903058-01 7705-001 0.629 U 0.597 105 N903058-02 7705-002 0.564 U 0.597 94 N903058-03 7705-003 0.874 U 0.804 109 N903058-04 7705-004 0.734 U 0.734 100 N903058-05 7705-005 0.386 U 0.386 100 N903058-06 7705-006 0.376 U 0.753 50 N903058-08 7705-008 U U U U N903058-09 7705-007 ok ok ok N903058-09 7705-009 ok - U ok 83 tts from method RDLs (pCi/g) 0.30 0.30 0.30 0.30 0.30	SAMPLE ID TEST FIX PLANCHET 233/234 235 238 1+3 2σ 024 N903058-01 7705-001 0.629 U 0.597 105 63 N903058-02 7705-002 0.564 U 0.597 94 62 N903058-03 7705-003 0.874 U 0.804 109 67 N903058-04 7705-004 0.734 U 0.734 100 56 N903058-05 7705-005 0.386 U 0.386 100 88 N903058-06 7705-006 0.376 U 0 0.753 50 36 N903058-08 7705-008 U U U U U N <td>SAMPLE ID TEST FIX PLANCHET 233/234 235 238 1+3 2σ 2+3 024 N903058-01 7705-001 0.629 U 0.597 105 63 19 N903058-02 7705-002 0.564 U 0.597 94 62 7 N903058-03 7705-003 0.874 U 0.804 109 67 0 N903058-04 7705-004 0.734 U 0.734 100 56 5 N903058-05 7705-005 0.386 U 0.386 100 88 28 N903058-06 7705-006 0.376 U 0.753 50 36 16 N903058-08 7705-008 U U U U N N903058-09 7705-007 ok ok ok ok ok N903058-09 7705-009 ok - U ok 83 52 11</td>	SAMPLE ID TEST FIX PLANCHET 233/234 235 238 1+3 2σ 2+3 024 N903058-01 7705-001 0.629 U 0.597 105 63 19 N903058-02 7705-002 0.564 U 0.597 94 62 7 N903058-03 7705-003 0.874 U 0.804 109 67 0 N903058-04 7705-004 0.734 U 0.734 100 56 5 N903058-05 7705-005 0.386 U 0.386 100 88 28 N903058-06 7705-006 0.376 U 0.753 50 36 16 N903058-08 7705-008 U U U U N N903058-09 7705-007 ok ok ok ok ok N903058-09 7705-009 ok - U ok 83 52 11

METHOD PERFORMANCE

	EST FIX pCi/g error 5.0 % Re			k min ke	eV KeV HELD	PREPARED	YZED	DETECTOR
- 1	error 5.0 % Re	ference Lab	Water land to the state of					
BOTVX5 N903058-01		rerence nun	NOTEDOOK #5821 }	og. 024				
1703038-01	0.29	0.500	72	102	12	03/19/99	03/20	SS-005
B0TVX6 N903058-02	0.31_	0.500	67	102	12	03/19/99	03/20	SS-006
B0TVX8 N903058-03	0.32	0.500	67	102	12	03/19/99	03/20	SS-007
B0TVX9 N903058-04	0.26	0.500	84	102	12	03/19/99	03/20	SS-009
B0TVY0 N903058-05	0.28	0.500	79	102	11	03/19/99	03/20	SS-011
B0TVY1 N903058-06	0.32_	0.500	68	102	11	03/19/99	03/20	SS-012
BLK (QC ID=30327) N903058-08	0.16	1.00	66	102		03/19/99	03/20	SS-015
LCS (QC ID=30326) N903058-07	0.35	1.00	77	116		03/19/99	03/20	SS-055
Duplicate (N903058-01) N903058-09	0.33	0.500	65	102	12	03/19/99	03/20	SS-016
(OC ID=30328)								

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06

Report date 03/30/99

SAMPLE DELIVERY GROUP H0354

Test	U	Matrix	SOLID
SDG	7705		
Contact	L.A.	Johnson	1

METHOD SUMMARY, cont.

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0354

PROCEDURES	REFERENCE	UPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-910	Jranium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0
L		

AVERAGES ± 2 SD MDA 0.29 ± 0.11

FOR 9 SAMPLES YIELD 72 = 14

METHOD SUMMARIES

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SUMMARY DATA SECTION

Page 23

 Lab id
 TMANC

 Protocol
 Hanford

 Version
 Ver 1.0

 Form
 DVD-CMS

 Version
 3.06

 Report date
 03/30/99

SAMPLE DELIVERY GROUP H0354

Test	SR	Matrix	SOLID
SDG	7705		
Contact	L.A.	Johnson	1

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0354</u>

RESULTS

	LAB	RAW SUF-	Total		
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX PLANCHET	Strontium	 	
Preparation batch 2851-	024				
BOTVX5	N903058-01	7705-001	39.3		
BOTVX6	N903058-02	7705-002	5.35		
30 TV X8	N903058-03	7705-003	79.3		
B0TVX9	N903058-04	7705-004	15.5		
BOTVYO	N903058-05	7705-005	U		
BOTVY1	N903058-06	7705-006	8.07		
BLK (QC ID=30327)	N903058-08	7705-008	Ü		
LCS (QC ID=30326)	N903058-07	7705-007	ok		
Ouplicate (N903058-01)	N903058-09	7705-009	ok		

METHOD PERFORMANCE

	LAB	RAW	SUF-	MAX M	DA ALIQ	PREP	DILU-	AIETD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	g	FAC	TION	ş	ş	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 2851-0)24 2σ pr	ep er	ror 10	ጋ.0 %	Reference	Lab	Noteboo	k #285	1 pg	. 024			-			
B0TVX5	N903058-01			1.9	0.100			90		400			11	03/18/99	03/19	GRB-217
B0TVX6	N903058-02			2.2	0.100			75		400			11	03/18/99	03/19	GRB-219
B0TVX8	N903058-03			3,3	0.100			49		400			11	03/18/99	03/19	GRB-219
BOTVX9	N903058-04			2.2	0.100			77		400			11	03/18/99	03/19	GRB-221
B0TVY0	N903058-05			2.0	0.100			82		400			10	03/18/99	03/19	GRB-222
BOTVY1	N903058-06			1.9	0.100			93		400			10	03/18/99	03/19	GRB-223
BLK (QC ID=30327)	N903058-08			0.60	1.00			34		148				03/18/99	03/19	GRB-231
LCS (QC ID=30326)	N903058-07			0.26	1.00			91		107				03/18/99	03/19	GRB-217
Duplicate (N903058-01)	N903058-09			2.0	0.100			85		150			11	03/18/99	03/19	GRB-232
(QC ID=30328)																
Nominal values and limit	s from metho	d		1.0	1.00		•••			100			180			

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford

Version Ver 1.3

Form <u>DVD-CMS</u>

Version 3.06

Report date 03/30/99

SAMPLE DELIVERY GROUP H0354

Test	SR	Matrix	SOLID
SDG	7705		
Contact	<u>L.</u> A.	Johnson	

METHOD SUMMARY, cont.

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0354

PROCEDURES RP-500 Strontium - Initial Separation, rev 0

RP-519 Strontium-89,90 Demounting and Yttrium

Purification, rev 0

AVERAGES ± 2 SD MDA __1.8 _ ± __1.8 _ FOR 9 SAMPLES YIELD __75 _ ± __41 _ ...

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Protocol <u>Hanford</u>

Version <u>Ver 1.3</u>

Form <u>DVD-CMS</u>

Version <u>3.06</u>

Report date <u>03/30/99</u>

Lab id TMANC

SAMPLE DELIVERY GROUP H0354

METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0354

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX		Cobalt 60	Cesium 137	
Preparation batch 2851-	024				· · · · · · · · · · · · · · · · · · ·	<u>. </u>
BOTVX5	N903058-01		7705-001	U	248	
BOTVX6	N903058-02		7705-002	U	11.9	
BOTVX8	N903058-03		7705-003	. u	182	
BOTVX9	N903058-04		7705-004	U	25.5	
BOTVY0	N903058-05		7705-005	ប	σ	
BOTVY1	N903058-06		7705-006	ប	36.0	
BLK (QC ID=30327)	N903058-08		7705-008	υ	U	
LCS (QC ID=30326)	N903058-07		7705-007	ok	ok	
Duplicate (N903058-01)	N903058-09		7705-009	ok	ok	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-	MAX MDA pCi/q	QILIA	PREP FAC	_	YIELD	EFF %	COUNT				PREPARED	ANAL-	DDmmomor
			FIX	pc1/g	9	FAC	11014	•	ъ	(11111	Kev	Kev	пеш	PREPARED	YZED	DETECTOR
Preparation batch 2851-	024 2σ pr	ep er:	ror 1	5.0 % Re:	ference	Lab	Noteboo	ok #285	1 pç	J. 024						
B0TVX5	N903058-01			0.53	159					101			10	03/13/99	03/19	JR,07,00
B0TVX6	N903058-02			0.053	166					436			10	03/13/99	03/18	JR,04,00
BOTVX8	N903058-03			0.49	149					103			10	03/13/99	03/18	JR,07,00
BOTVX9	N903058-04			0.21	182					102			10	03/13/99	03/18	JR,07,00
BOTVYO	N903058-05			0.13	183					101			9	03/13/99	03/18	JR,07,00
B0TVY1	N903058-06			0.17	159					185			10	03/13/99	03/19	JR,01,00
BLK (QC ID=30327)	N903058-08			0.018	750					142				03/13/99	03/19	JR.07,00
LCS (QC ID=30326)	N903058-07			0.022	750					185				03/13/99	03/19	JR,03,00
Duplicate (N903058-01)	N903058-09			0.25	.58					184			11	03/13/99	03/19	JR,04,00
(QC ID≠30328)																
Nominal values and limit	s from method	d		0.050	750					100			180			

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>

Version Ver 1.0

Form DVD-CMS

Version 3.36

SAMPLE DELIVERY GROUP H0354

Test	GAM	Matrix	SOLID
SDG	7705		
ontact	I. A	Johnson	1

METHOD SUMMARY, cont.

GAMMA SCAN
GAMMA SPECTROSCOPY

Client	Hanford							
Contract	TRB-SBB-207925							
Case no	SDG-H0354							

REFERENCE	GAMMAHI
EP-060	Soil Preparation, rev 0
EP-100	Ge(Li) Preparation for Environmental Samples,
	rev 0

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.3
Form DVD-CMS
Version 3.06

SAMPLE DELIVERY GROUP H0354

Test NI L Matrix SOLID
SDG 7705

Contact L.A. Johnson

METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client <u>Hanford</u>

Contract TRB-SBB-207925

Case no SDG-H0354

RESULTS

	LAB	RAW SUF-			•
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX	PLANCHET	Nicke	kel 63
Preparation batch 2851-	024				
BOTVX5	N903058-01		7705-001	Ü	
B0TVX6	N903058-02		7705-002	Ū	
BOTVX8	N903058-03		7705-003	· U	
BOTVX9	N903058-04		7705-004	U	
BOTVYO	N903058-05		7705-005	U	
BOTVY1	N903058-06		7705-006	U	
BLK (QC ID=30327)	N903058-08		7705-008	Ū	
LCS (QC ID=30326)	N903058-07		7705-007	ok	
Duplicate (N903058-01)	N903058-09		7705-009	~	U
					
Nominal values and limit	ts from metho	d RD	Ls (pCi/g)	20	
100 BC Areas-Quick Turn					

METHOD PERFORMANCE

	L AB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX	pCi/g	g 	FAC	TION	¥	8	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 2851-	024 2σ pr	ep er	ror 10	.0 %	Reference	Lab	Noteboo	ok #285	1 pg	r. 024			·			
B0TVX5	N903058-01			2.4	0.500					100			17	03/19/99	03/25	LSC-005
BOTVX6	N903058-02			2.4	0.500					100			17	03/19/99	03/25	LSC-005
BOTVX8	N903058-03			2.5	0.500					100			17	03/19/99	03/25	LSC-005
BOTVX9	N903058-04			2.2	1.500					100			17	03/19/99	03/25	LSC-005
B0TVY0	N903058-05			2.9	0.500					100			16	03/19/99	03/25	LSC-005
B0TVY1	N903058-06			2.4	1.500					100			16	03/19/99	03/25	LSC-005
BLK (QC ID=30327)	N903058-08			2.0	0.500					100				03/19/99	03/25	LSC-005
LCS (QC ID=30326)	N903058-07			2.0	0,500					100				03/19/99	03/25	LSC-005
Duplicate (N903058-01)	N903058-09			2.4	0,500					100			17	03/19/99	03/25	LSC-005
(QC ID=30328)																
Nominal values and limit	ts from metho	d		20	0.500					10			180			

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form DVD-CMS

Version 3.06

SAMPLE DELIVERY GROUP H0354

Test	NI L	Matrix	SOLID
SDG	7705		
Contact	L.A.	Johnson	1

METHOD SUMMARY, cont.

NICKEL 63 IN SOIL LIQUID SCINTILLATION COUNTING

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0354

PROCEDURES REFERENCE NI63LSC

EP-060 Soil Preparation, rev 0

EP-431 Nickel-63 Purification, rev 0

METHOD SUMMARIES

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SUMMARY DATA SECTION

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SDG 7705
Contact L.A. Johnson

REPORT GUIDE

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0354</u>

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

REPORT GUIDES

Page 1
SUMMARY DATA SECTION

Page 30

SDG 7705
Contact L.A. Johnson

REPORT GUIDE

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0354</u>

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

REPORT GUIDES

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SUMMARY DATA SECTION

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SDG 7705
Contact L.A. Johnson

REPORT GUIDE

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0354</u>

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

REPORT GUIDES

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SUMMARY DATA SECTION

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SDG 7705
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0354

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

REPORT GUIDES

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SUMMARY DATA SECTION

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SDG 7705
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0354

DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

REPORT GUIDES

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SUMMARY DATA SECTION

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 Lab id
 TMANC

 Protocol
 Hanford

 Version
 Ver 1.0

 Form
 DVD-RG

 Version
 3.06

 Report date
 03/30/99

SDG 7705
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0354

DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-RG</u>

Version <u>3.06</u>

Report date <u>03/30/99</u>

SDG 7705
Contact L.A. Johnson

REPORT GUIDE

Client <u>Hanford</u>
Contract <u>TRB-SBB-207925</u>
Case no <u>SDG-H0354</u>

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 - 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

- 2. The error of ADDED.
- 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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 Hanford

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 Form
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 Version
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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:
 - 1. A fixed percentage specified in the protocol.

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DUPLICATE

- 2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.
- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 - 1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

- 2. The error of ADDED.
- 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Prepareation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1 \pm 3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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Bechtel Hanford In	ic.	(CHAIN OF CUS	STODY/S	AMPLE	ANALY				· B 99-	001-100	Page	
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Bechtel Hanford I	nc.	CH	HAIN OF CUST	TODY/S	AMPLE	ANAL	YSIS I	REQUEST	·	B99	9-001-101	Page <u>l</u>	of <u>l</u>
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FINAL SAMPLE Disposal Me	thod					Disp	posed By					Date/Time	

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT								
Client:	Bechtel Hanford Date/Ti	me received <u>á</u>	1-13-99 1	1:00				
CoC No. <u>B99-001-100</u> , <u>B94-001-101</u>								
Shipping Cans Container I.D. No. 96-002 Requested TAT (Days) 7 P.O. Received Yes [] No [L]								
INSPECTION								
1.	Custody seals on shipping container intact?	Yes [🏒	No []	N/A []				
2.	Custody seals on shipping container dated & signed?	Yes [2]	No []	N/A []				
3.	Custody seals on sample containers intact?	Yes [No []	N/A []				
4.	Custody seals on sample containers dated & signed?	Yes [L	No []	N/A[]				
5.	Cooler Temperature: Packin	g material is:	Wet []	Dry [L]				
6.	Number of samples in shipping container:			ti U				
7.	Number of containers per sample: 2	(Or see CoC	1					
8.	Paperwork agrees with samples?	Yes [📈	No []					
9.	Samples have: Tape () Hazard labels [] Rad lab	oels [] Appro	priate sample l	abels {᠘-				
10.	Samples are: In good condition [] Leaking [] Broken Container [] Missing []							
11.	Describe any anomalies:							
	<u> </u>							
13.	Was P.M. notified of any anomalies? Yes []	No[]D	ate					
14.	Received by full constant Date	: 3-13-90	7 Time: 11	:00				
LOGIN								
TNU V	V.O. No Group No	Clier	nt W.O. No					
PROGRAM MANAGER								
Sample holding times exceeded? Yes [] No []								
Client Notified: Name Date/time								

Contractor BHI - Hanford

OFF-SITE **PROPERTY CONTROL**

	CONTROL NO.
(To	be obtained from PROPERTY MANAGEMENT)
	be obtained from PROPERTY MANAGEMENT)
	THURION

PART I - TO BE COMPLETED BY ORIGINATOR							
Department ERC Engineering Support Section Field & Analytical Support Field Sampling							
The following items are to be shipped from 💢 Contractor 🔲 Vendor							
Routing X Prepaid Collect							
Shipped Compar Address City Country	2030 Wi Richmon (510)23	Nutech right Ave nd, CA 94804-0040 35-2633 State Zip Code Johnson	Payroll No.				
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1	lbs. XXXX	Sample #: Cooler ID: Polycooler with environmental samples packed in packing peanuts. BILL OF LADING #	N/A				
		☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Perm	nit Contract				
Required for Project Work. List Project No. Business Trip Off-site Assignment Shipment to Subcontractor. List Subcontract No. Other (Please specify)							
		E RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVER	ED TO SHIPPING.				
RM Cle	arance for Public	Release No.	Date				
Location of and Contact for Property (Name/Phone No./Bidg./Area) Renee Nielson/(509)372-9604/3728 Bldg/300 Area Date Ready for Shipment Cost Code to be Charged P.) N Approximate Date This Property will be Returned Originated By Date Originated By Date Originated By Date Date Originated By Date Da							
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White - Property Management

Yellow - Shipping Green - Accounts Payable

Pink - Originator

Goldenrod - Property Management